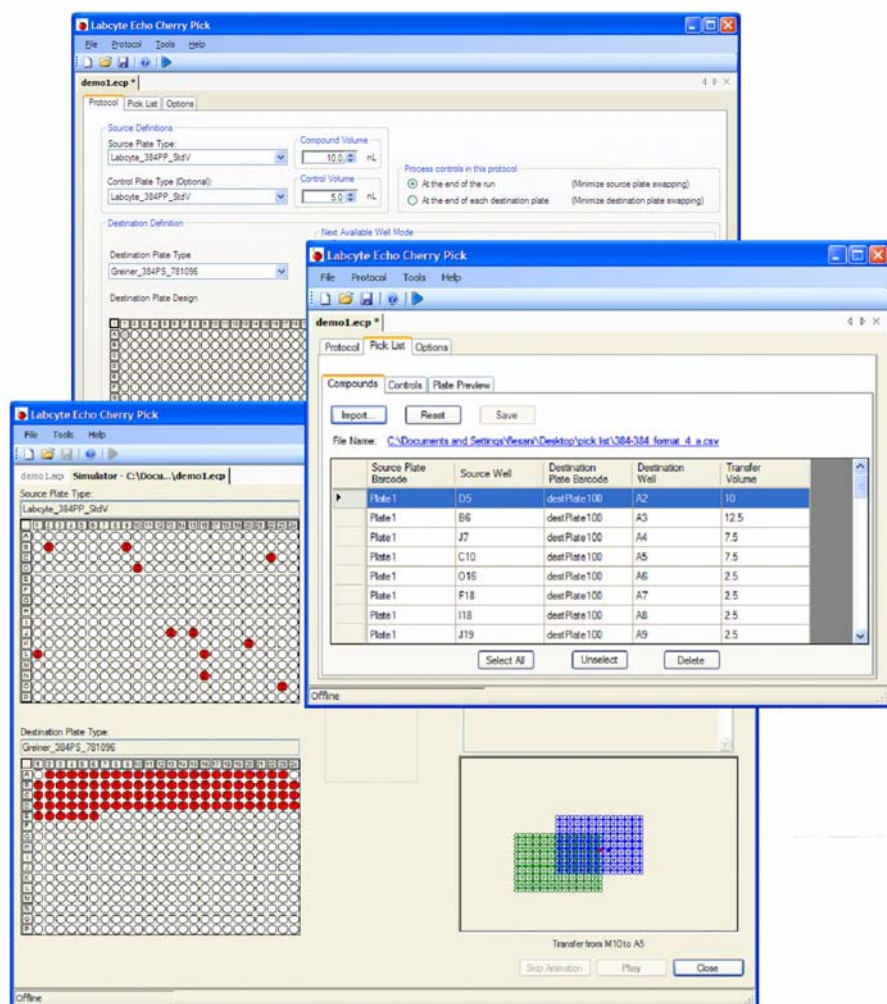




Echo[®] Cherry Pick software



User Manual Software version 1.2

The information contained in this manual is subject to change without notice.

Any unauthorized changes or modifications to the Echo[®] Cherry Pick application will void its warranty.
Contact Labcyte Inc. prior to making any change or modification.

Copyright © 2008 Labcyte Inc. All rights reserved.

Printed in the United States of America.

Microsoft, Windows, Windows XP, ActiveX, and Microsoft SQL Server are either registered trademarks or trademarks of Microsoft Corporation in the United States and/ or other countries.

Pentium III and Pentium 4 are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

All other registered or unregistered trademarks used herein are the exclusive property of their respective holders.

For research purposes only; not for use in diagnostics.

The Echo liquid handler is covered by one or more of the following patents:

6,416,164; 6,548,308; 6,603,118; 6,612,686; 6,642,061; 6,666,541; 6,707,038; 6,710,335; 6,746,104; 6,802,593; 6,808,934; 6,809,315; 6,849,423; 6,855,925; 6,869,551; 6,893,836; 6,893,115; 6,916,083; 6,932,097; 6,938,987; 6,938,995; 6,991,917; European Patent EP 1337325.

Additional patents pending in the United States and other countries.

Table of Contents

Preface	1
Intended Audience	1
Software Requirements	1
Manual Organization	2
Manual Convention.....	2
1 Introduction	3
1.1 What is a Pick List?	4
1.2 What are the benefits?	6
1.3 Documentation	7
2 Getting Started	9
2.1 Start the Software	9
2.2 Activate the Instrument.....	11
2.3 Main Window	13
2.4 Set Up the Software	15
2.5 Shut Down the Software	16
3 Software Overview	17
3.1 Create Pick Lists.....	18
3.1.2 Pick List Formats.....	19
3.1.3 Pick List Header Data.....	23
3.1.4 Pick list file format.....	25
3.2 Set up the Transfer Protocol	26
3.3 Import Compound and Control pick lists.....	29
3.4 Run a Simulation.....	35
3.5 Set up Plates.....	37
3.6 Run a Protocol	38
4 Software Reference	42
4.1 Toolbar	43
4.2 Protocol.....	44
4.2.1 Source Plate Definition.....	44
4.2.2 Destination Definition	44
4.3 Labware Definitions	46
4.3.1 Plate Type List	46
4.3.2 Plate Type Editor.....	48
4.3.3 Plate Export.....	51
4.4 Pick List	52
4.4.1 Compounds and controls window	52
4.4.2 Plate Preview window.....	54
4.4.3 Import Compound and Control List windows.....	55
4.5 Protocol Options	56
4.5.1 Survey History.....	57
4.5.2 Output Files.....	59

4.5.3	File Type.....	59
4.6	Preferences	64
4.7	Run Protocol	65
4.8	Simulator window	66
4.9	Run Status window	70

Preface

Intended Audience

The Echo Cherry Pick program is designed for use by laboratory personnel. This software application assists the researcher by automating individual sample transfer.

Software Requirements

To use the Echo Cherry Pick application, you must meet the following requirements:

- Echo 5XX Liquid Handler system using software version 2.1 or later.
- License key from Labcyte Inc.
- Computer system meeting the following requirements:

Operating system: Microsoft® Windows® XP SP2 or later; .Net Framework 2.0

CPU: Intel® Pentium® 4 or later (2GHz or greater)

Memory: 512 MB or higher

Network connection: 10/100/1000 BaseT

Network protocol: TCP/IP

Hard drive storage: 200 MB

Video: 1024 X 768 resolution, 256 colors or better

The Echo Cherry Pick application works closely with the Echo 5XX client software and should be installed on the same client PC.

Manual Organization

This manual is provided on CD and accompanies the Echo Cherry Pick installation CDs. Software procedures and screen descriptions in this manual are also available in the Help section of the Echo Cherry Pick application.

The Echo Cherry Pick user manual is organized as follows:

Chapter 1, Introduction

Chapter 2, Getting Started

Chapter 3, Software Overview

Chapter 4, Software Reference

Manual Convention

Some of the text in this manual uses special formatting to indicate emphasis or keystrokes. The text conventions are described below:

Convention	Example	Meaning
Bold text	Press the Next button.	Indicates an on-screen button, label, menu title, or menu item.
Courier	<code>client.txt</code> , <code>client.old2.txt</code>	Indicates a display output, printed output, keyboard input, or file name.
Italic, underlined	<u><i>Software installation</i></u>	Signifies an internet link.
Quotation marks	See <i>"Set up Preferences"</i> on page 14.	Refers you to a topic elsewhere in the manual. Usually includes a hyperlink.

1 Introduction

The Echo Cherry Pick software offers significant flexibility in transferring nanoliter volumes of compound from any well position on a microplate to another microplate. With this program you can transfer compounds from several plates to a single plate—or transfer compound from a single plate to multiple plates.

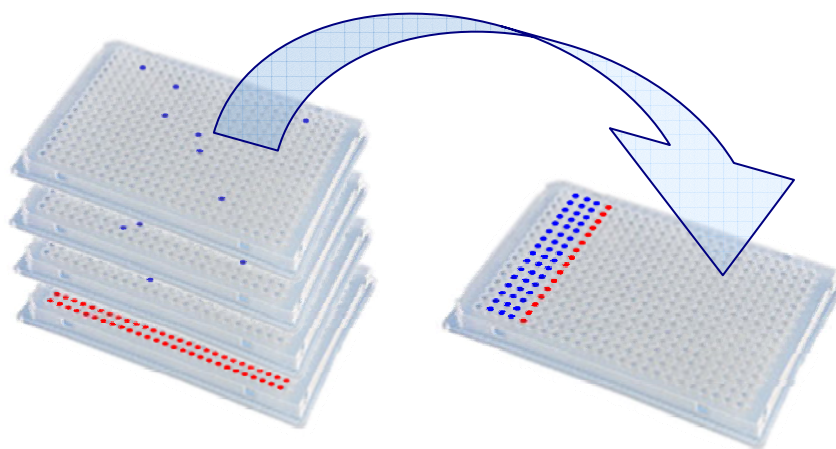


Figure 1-1: Compounds and controls from multiple source plates to single destination plate

The Echo Cherry Pick software uses the pick list that you create to automate the transfer of compound from selected wells. You can transfer point-to-point (from B3 source well to B3 destination well) or allow the software to fit compounds onto a plate. The program keeps track of the transfer process and reports final well positions in customizable reports.

1.1 *What is a Pick List?*

The pick list is a table of specific compounds that have been selected from a group of compounds for analysis. The pick list is typically created in a text or spreadsheet file.

Note: Pick lists must be in csv (comma-separated value) format to be used by the Echo Cherry Pick software.

Figure 1-2 is a simple pick list that lists source plate ID, source well ID, and volume to be transferred. The location of each compound on the destination plate is determined by the software and placed in the next available empty well.

	A	B	C
1	Source Plate Barcode	Source Well	Transfer Volume
2	Plate1	D5	2.5
3	Plate1	B6	2.5
4	Plate1	J7	2.5
5	Plate1	C10	2.5
6	Plate1	O16	2.5
7	Plate1	F18	2.5
8	Plate1	I18	2.5
9	Plate1	J19	2.5
10	Plate1	G20	2.5
11	Plate1	B21	2.5
12	Plate3	N5	2.5
13	Plate3	L6	2.5
14	Plate3	O7	2.5
15	Plate3	C9	2.5
16	Plate3	D12	2.5
17	Plate3	D16	2.5
18	Plate3	E19	2.5
19	Plate3	I21	2.5
20	Plate3	M21	2.5

Figure 1-2: Pick list sample #1

Figure 1-3 shows a pick list that specifies well location (row and column) instead of well ID. It also explicitly states the destination well location. The Echo Cherry Pick software can accommodate many types of pick lists.

	A	B	C	D	E	F	G
1	Source Plate Barcode	Source Row	Source Column	Destination Plate Barcode	Destination Row	Destination Column	Transfer Volume
2	Plate1	4	5	destPlate100	1	1	2.5
3	Plate1	2	6	destPlate100	1	2	2.5
4	Plate1	10	7	destPlate100	1	3	2.5
5	Plate1	3	10	destPlate100	1	4	2.5
6	Plate1	15	16	destPlate100	1	5	2.5
7	Plate1	6	18	destPlate100	1	6	2.5
8	Plate1	9	18	destPlate100	1	7	2.5
9	Plate1	10	19	destPlate100	1	8	2.5
10	Plate1	7	20	destPlate100	1	9	2.5
11	Plate1	2	21	destPlate100	1	9	2.5
12	Plate3	14	5	destPlate100	2	10	2.5
13	Plate3	12	6	destPlate100	2	1	2.5
14	Plate3	15	7	destPlate100	2	2	2.5
15	Plate3	3	9	destPlate100	2	3	2.5
16	Plate3	4	12	destPlate100	2	4	2.5
17	Plate3	4	16	destPlate100	2	5	2.5
18	Plate3	5	19	destPlate100	2	6	2.5
19	Plate3	9	21	destPlate100	2	7	2.5
20	Plate3	13	21	destPlate100	2	8	2.5

Figure 1-3: Pick list sample #2

1.2 *What are the benefits?*

The Labcyte Echo Cherry Pick software works seamlessly with the Echo Liquid Handler and provides the following benefits:

Fast

- ◆ Saves time by efficient transfer
- ◆ Executes superior data management
- ◆ Maintains survey history

Flexible

- ◆ Uses pick lists to define well locations and volumes for transfer
- ◆ Customizes reports to match your informatics infrastructure
- ◆ Generates output files in XML, CSV, and TXT format
- ◆ Transfer from 384- or 1536-well Echo qualified source plates to 96-, 384-, 1536-, or 3456-well assay plates
- ◆ Allows the output files to be run specific or destination plate specific

Accurate

- ◆ Automates manual steps
- ◆ Removes washing steps and cross contaminations

1.3 Documentation

In addition to this manual, the Echo Cherry Pick software comes with the following useful documents:

- ♦ Online Help
- ♦ Quick Start Guide

Online Help

Online Help is available in the Echo Cherry Pick software. It contains screen descriptions and procedures.

You can view online Help by using one of the following methods in the software:

- ♦ Click the **Help icon**  or **Help menu** in the software toolbar to view the complete Help file.

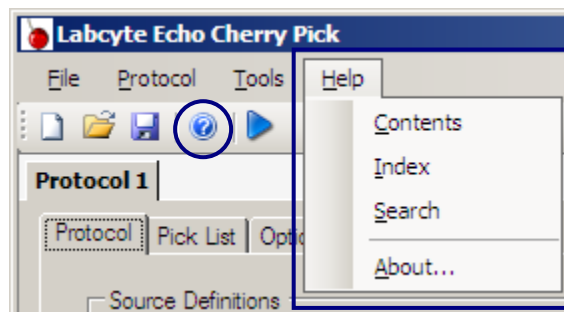



Figure 1-4: Access to Help from the Toolbar

- ♦ Click the Help icon  in the upper right corner of individual software screens to view the Help page for that screen.

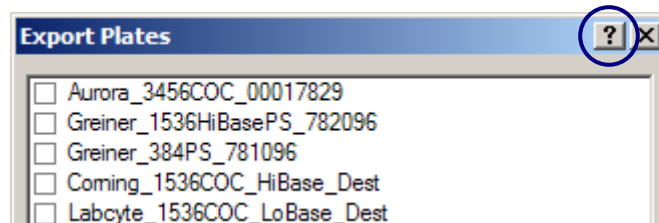


Figure 1-5: Access to Help from the software screen

- ♦ Press the **Help** (F1) key on the computer keyboard to view the Help page for the displayed screen.

Quick Start Guide

The Echo Cherry Pick Quick Start Guide describes the capabilities of the Echo Cherry Pick software and takes you through a sample protocol.

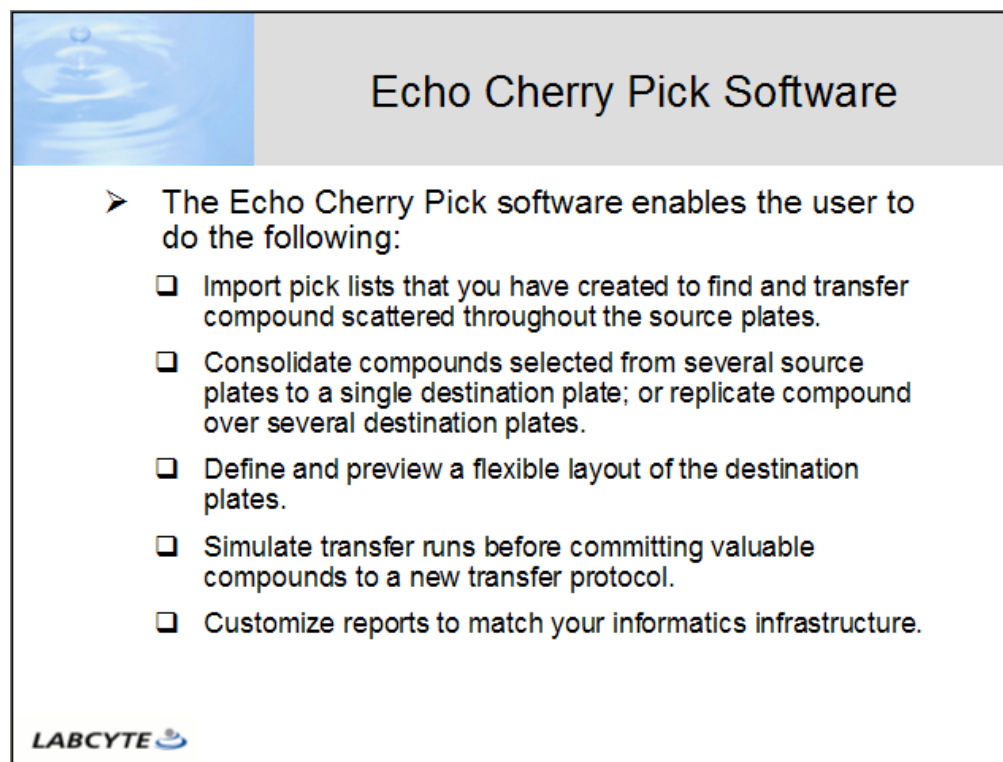


Figure 1-6: Quick Start Guide

The Quick Start Guide can be found in the Echo Cherry Pick directory. You will need Adobe Acrobat Reader to open this document.

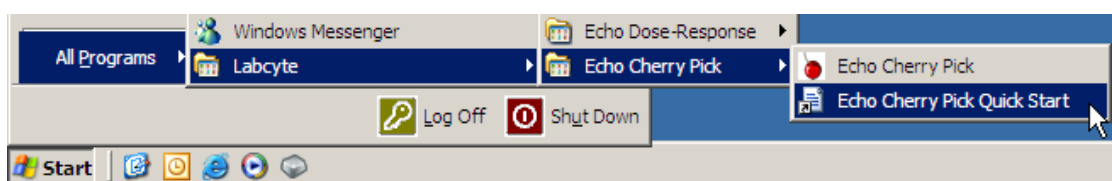


Figure 1-7: Location of Quick Start Guide

2 Getting Started

This chapter describes the basic tasks to start, set up, and finally exit the software.

2.1 *Start the Software*

To start the Echo Cherry Pick software:

1. Open the **Start** menu.
2. Select All Programs (or Programs) -> Labcyte -> Echo Cherry Pick.
3. Select the **Echo Cherry Pick** program.

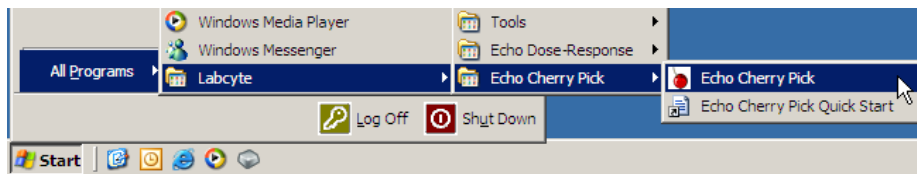



Figure 2-1: Location of Echo Cherry Pick application

Hint: To create a shortcut to the Echo Cherry Pick software on your computer desktop, press and hold the **Control** key while you drag the Echo Cherry Pick icon  to the desktop.

The software begins with the *Connect to Instrument* screen.

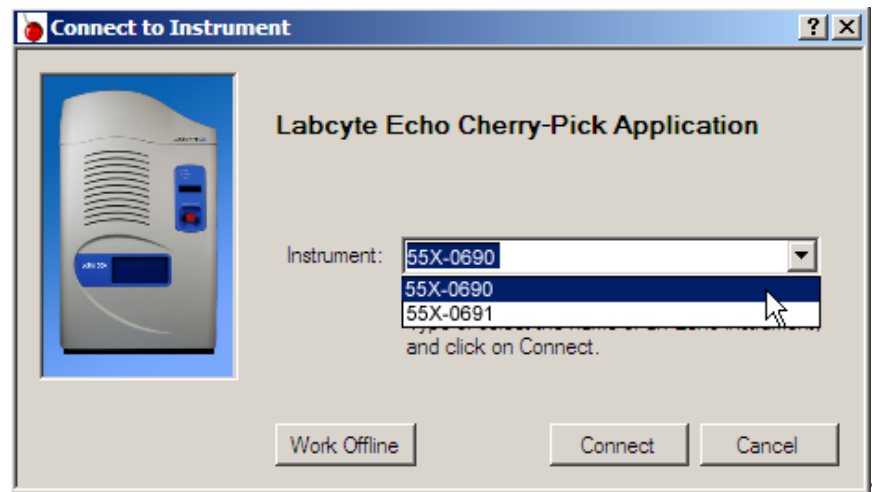


Figure 2-2: Connect to instrument screen

You can connect to the instrument at this time or work offline and connect when you are ready to run the protocol.

Note: If you do not see an instrument in the *Instrument* field, the instrument is not yet activated for the software. Even if an instrument appears in the *Instrument* field, if you recently installed or upgraded the software, you will need to activate the instrument. Go to *Activate the Instrument* on page 11.

4. Select one of the following start options:

Connect: Select an Echo liquid handler from the *Instrument* menu and click **Connect**. The Main Window opens with the connection status instrument information at the bottom of the screen. This option enables you to execute the compound transfer as soon as the transfer protocol is ready.

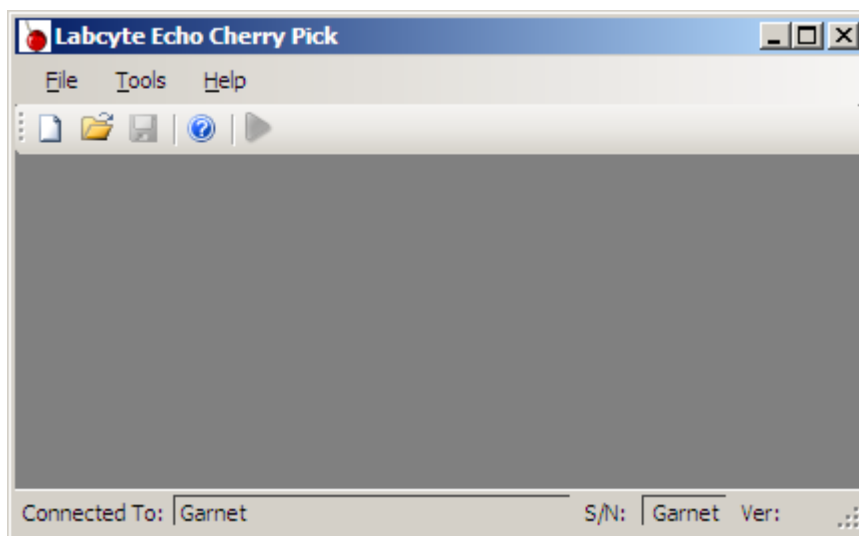


Figure 2-3: Echo Cherry Pick software connected to Echo liquid handler

Work Offline: Click **Work Offline**. The Main Window opens with the connection status "offline" at the bottom of the screen. This option enables you to create a transfer protocol and run the transfer simulation without connecting to the Echo liquid handler.

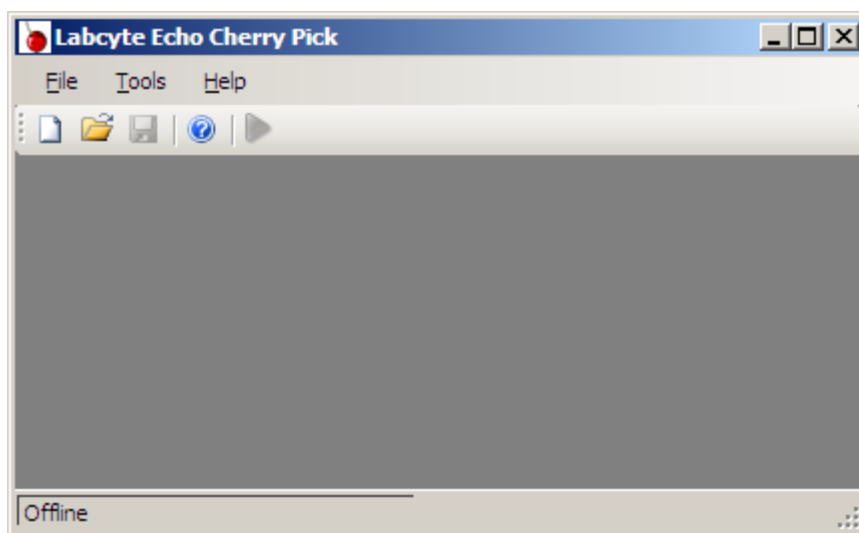


Figure 2-4: Echo Cherry Pick software offline

2.2 *Activate the Instrument*

To run the Echo Cherry Pick software on an Echo liquid handler, you will need to activate the instrument with a software license key from Labcyte.

- If you purchased the Echo liquid handler and Echo Cherry Pick software at the same time, your instrument will be delivered with the key pre-installed. You can skip this activation section.
- If you purchased the Echo Cherry Pick software separately or upgraded the software, then you will have to perform this task.

To activate the instrument:

1. Start the Echo Cherry Pick software.
2. In the *Connect to Instrument* screen, click the **Work Offline** button.

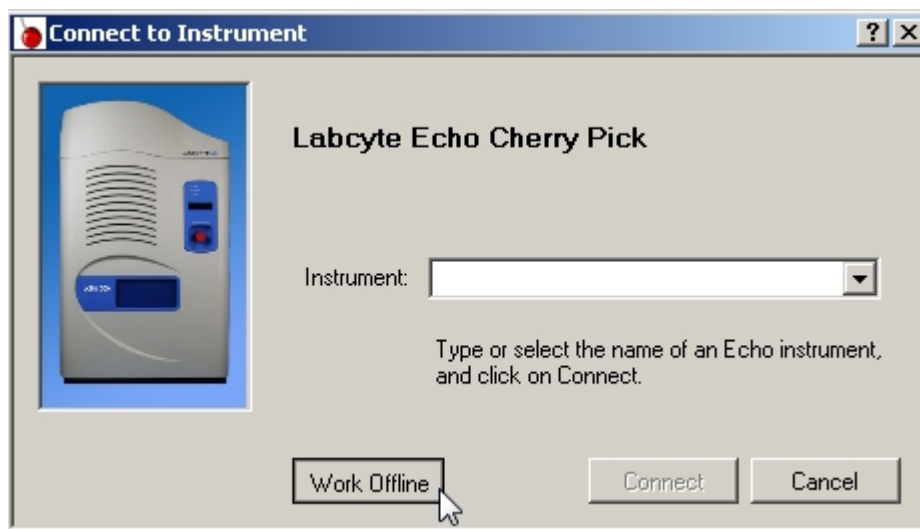
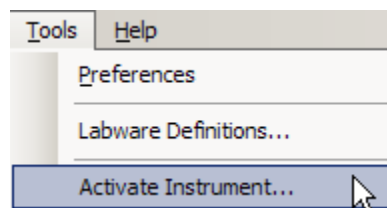


Figure 2-5: Connect to instrument

3. Click the *Tools* tab in the *Toolbar* and select the **Activate Instrument** option.
4. Enter the IP address of the Echo server.
5. Enter the license key. The license key is an encrypted block of text that authorizes the user to run the Echo Cherry Pick software with a specific Echo liquid handler.



You can insert the license key in one of the following ways:

- ♦ Copy the license key from the file you received from Labcyte and paste it into the *License Key* text box.
- ♦ Click the **Open License Key File** button and browse for the license key file.

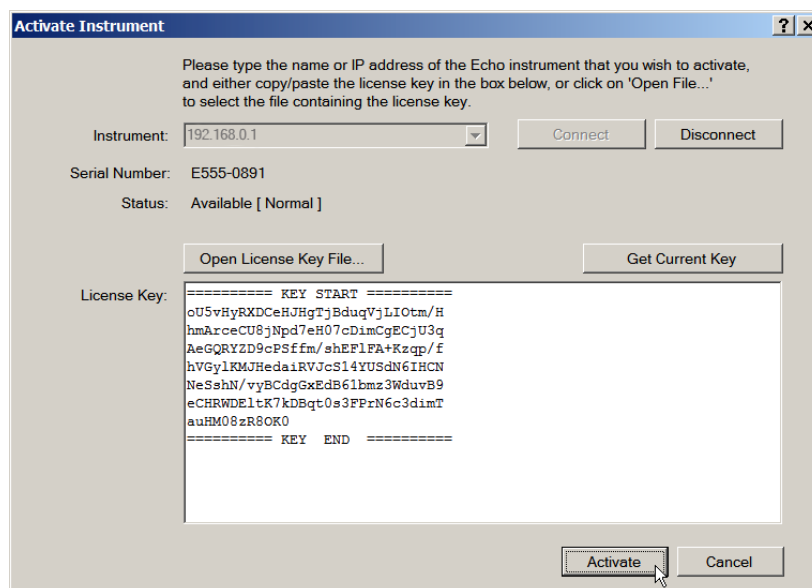


Figure 2-6: Activate instrument screen

Note: The **Get Current Key** function is a useful troubleshooting tool to verify that the key is written correctly to the instrument. When you click the **Get Current Key** button, the software will search for the license key and insert it into the *License Key* text box. Send the encrypted key to Labcyte to determine if the license key is corrupted or if it applies to a different instrument.

6. Click the **Activate** button.

The Echo liquid handler is now activated. You will not have to perform this procedure again unless you need to activate a different instrument or upgrade the software.

2.3 Main Window

When you open a new or existing protocol, the *Main Window* displays the *Protocol* window.

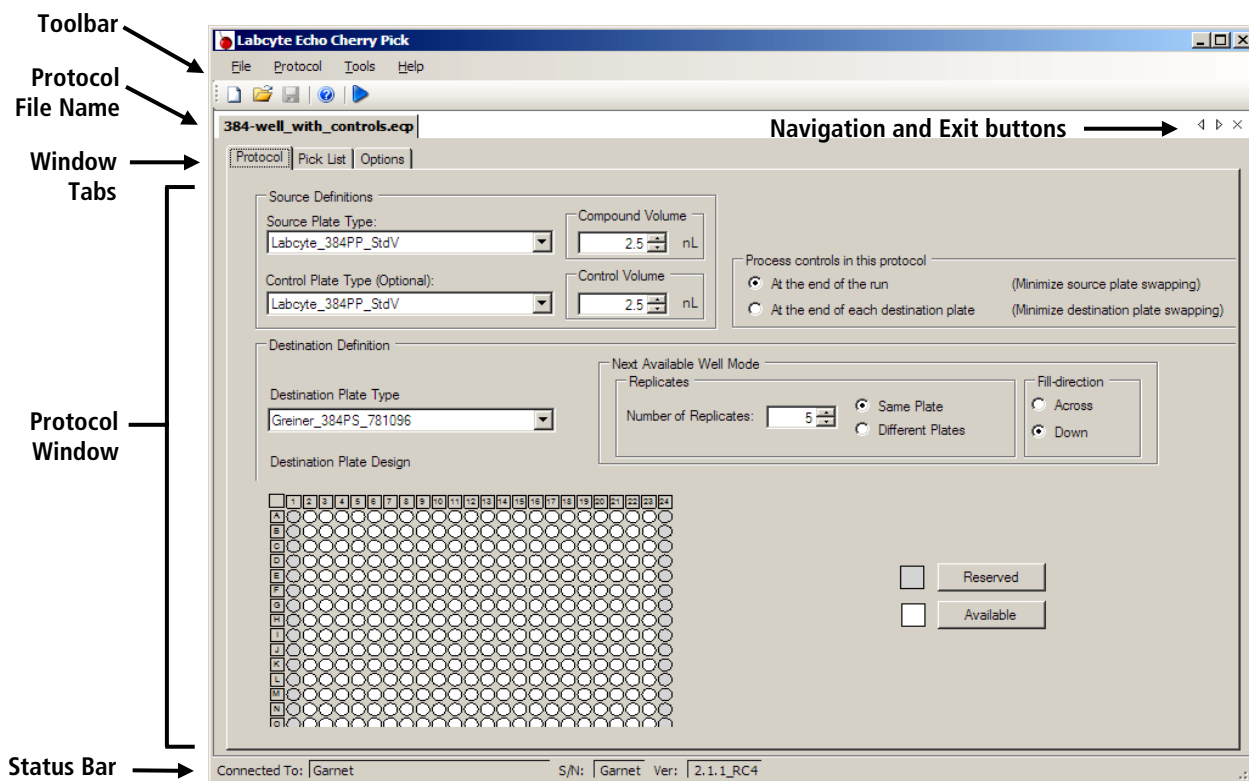


Figure 2-7: Main Window

Screen Components

The components in the *Main Window* are described below.

Toolbar: The toolbar contains software menus that provide access to functions to open and save transfer protocols, set up the software, define labware, run the protocol, customize protocol options, and display the online Help. The *icons* in the toolbar provide shortcuts to the most frequently-used functions, such as the *Run Protocol*/function. For a detailed description, see “*Toolbar*” on page 43.

Protocol file name: The protocol file name identifies your transfer protocol in the computer’s directory. The software uses an “.ecp” file extension and stores the file in the default directory: C:\Labcyte\Echo\Protocols. You can store your protocols in different directories.

Window tabs: The window tabs open the following software windows:

- **Protocol window:** The *Protocol* window is the first window that is displayed when you open a new or existing protocol. It contains all of the default protocol data necessary to perform the transfer. For a detailed description, see “*Protocol*” on page 44.
- **Pick list window:** The *Pick list* window contains functions to import, edit, preview, and save pick lists. These functions are organized in the following windows:
 - ◆ **Compounds:** compound pick lists that represent unique compounds on one or more plates.
 - ◆ **Controls:** control pick lists that represent control compounds that are added to every plate. Controls are optional. If control pick lists are not imported, the software ignores the control settings in the protocol.
 - ◆ **Plate Preview:** To display plate layout for source and destination plates.

For a detailed description of the windows, see “*Pick List*” on page 51.

- **Options window:** The *Options* window (behind the *Plate Design* window) displays protocol-specific options, such as survey history, output file type, and report formats. For a detailed description, see “*Protocol Options*” on page 56.

Status bar: The status bar displays Echo connection information, such as instrument name and serial number, and the version of Echo client software that is running.

Navigation and Exit buttons: The left and right arrow heads (◀ ▶) become active when you have too many protocols open to view all of the file names. The arrows shift the protocol tabs left or right to display the file names. The **Exit** icon (✕) closes the displayed protocol.

2.4 Set Up the Software

Your Echo Cherry Pick software needs very little setup. It comes with default settings, such as output file type and report format, that can be used. The Echo Cherry Pick software provides transfer data in three file formats (csv, xml, and txt) with reporting options that can be customized to meet your needs.

If you want to change these settings, refer to the procedures in this section; otherwise continue to the next section, *“Software Overview”*, on page 17.

To set up preferences:

1. Open the *Tools* menu and select **Preferences**.

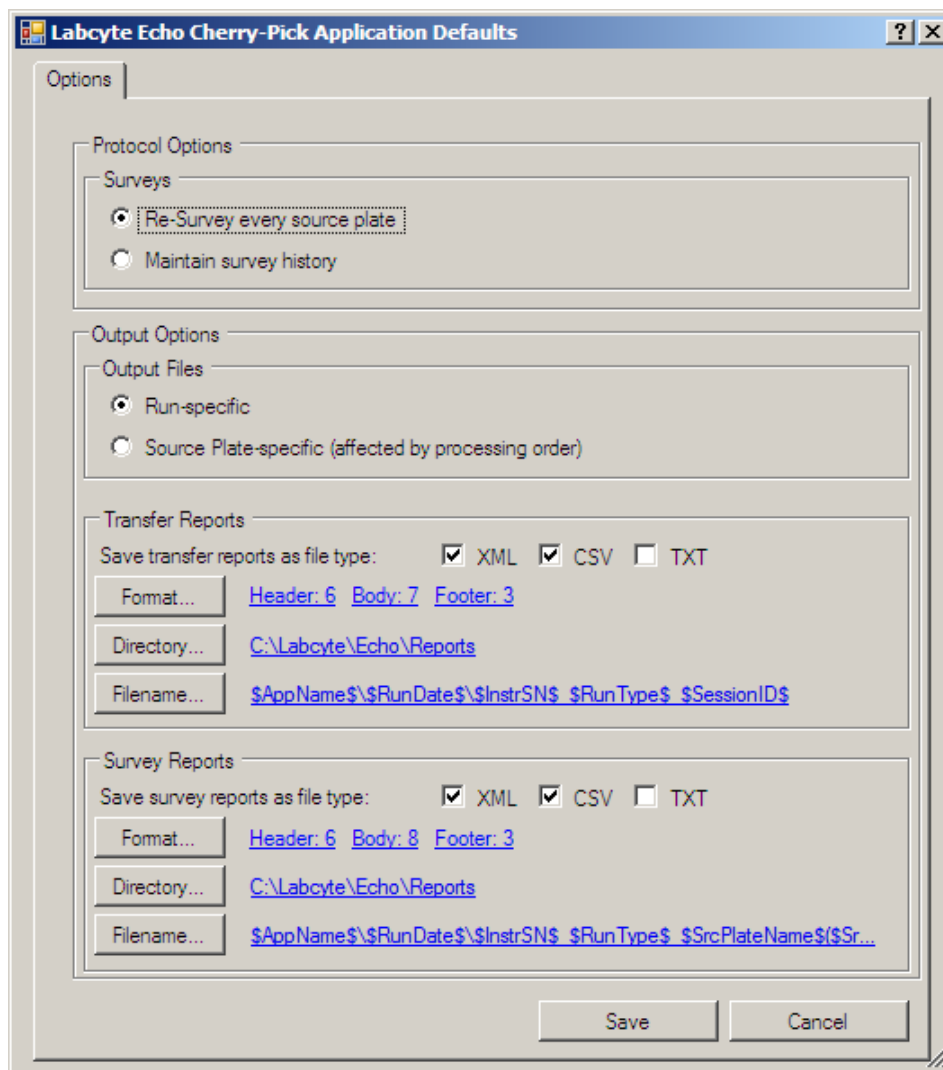


Figure 2-8: Preferences/Options screen

2. Select **Maintain survey history** if you want to re-use the current plate survey for more than one transfer operation for a specified period of time. Go to *“Survey History”* on page 57 for information about this feature.

-
3. Select **Run-specific** or **Plate-specific** output files.
 - ♦ **Run-specific:** Store all protocol data in one file.
 - ♦ **Plate-specific:** Store the protocol data in separate files, based on source or destination plates (depending on which process order you specified in the *Plate Design* window)
 4. Customize transfer and survey reports:
 - ♦ **File type:** Select XML, CSV, and/or TXT file formats.
 - ♦ **Format:** Customize the transfer report header, body, and footer.
 - ♦ **Directory:** Change the directory location for the transfer report.
 - ♦ **Filename:** Change the file name for the transfer report

These options will be used as default settings for all transfer protocols. If you want to change the options for an individual protocol, use the *Options* tab. See “*Preferences*” on page 64 for more information.

2.5 Shut Down the Software

You can exit the Echo Cherry Pick software in the following ways:

- Open the *File* menu and select **Exit**.

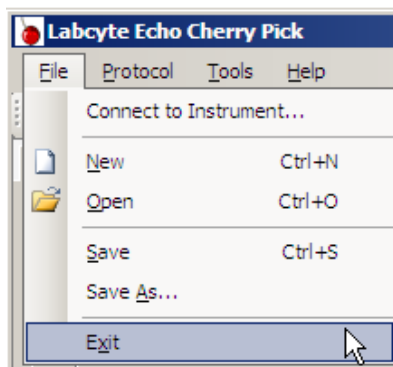


Figure 2-9: Exit function in the File menu

- Click the **Close** icon in the software window.

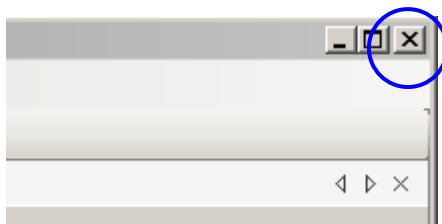


Figure 2-10: Close Window icon

3 Software Overview

The best way to describe the features of the Echo Cherry Pick software is to take you through the steps to create and execute a transfer protocol.

What is a transfer protocol?

In the Echo Cherry Pick software, the transfer protocol is a set of default parameters that provides the Echo liquid handler all the information needed to set up a run. The only information needed at runtime is the pick lists.

The software automatically creates the optimal transfer sequence that is sent to the Echo liquid handler to execute the direct compound transfer to assay plates.

After the transfer is complete, you can retrieve custom reports that document the transfer run and provide well data for sample tracking.

Sample transfer protocol

The sample transfer protocol in this chapter uses only three compounds to illustrate a simple compound transfer.

Throughout this overview, there will be references to specific topics in the *Software Reference* chapter, beginning on page 42, which can provide additional details.

The steps to creating and executing a transfer are listed below:

1. **Create pick lists:** created by the user to list specific compound from one or more plates to be transferred.
2. **Set up the Transfer Protocol:** created by the user in the Echo Cherry Pick software.
3. **Import Compound and Control pick lists:** performed by the user in the Echo Cherry Pick software.
4. **Set Up Plates:** performed by the user before running the protocol.
5. **Specify the order of transferring compound:** performed by the Echo Cherry Pick software and Echo 5XX liquid handler.
6. **Run the Protocol:** performed by the Echo Cherry Pick software and Echo 5XX liquid handler.
7. **Manage Transfer Data:** generated by the Echo Cherry Pick software, based on user settings.

Each step contains screen descriptions and procedures. By the end of this section, you will have a good basic understanding of the Echo Cherry Pick software.

3.1 Create Pick Lists

The Echo Cherry Pick software can use pick list formats that range from basic pick lists that contain only source plate ID and well locations, to more specific pick lists that also contain destination plate ID, destination well locations, and transfer volumes. Pick list options are shown in the *Import Compound List* screen (see Figure 3-1)

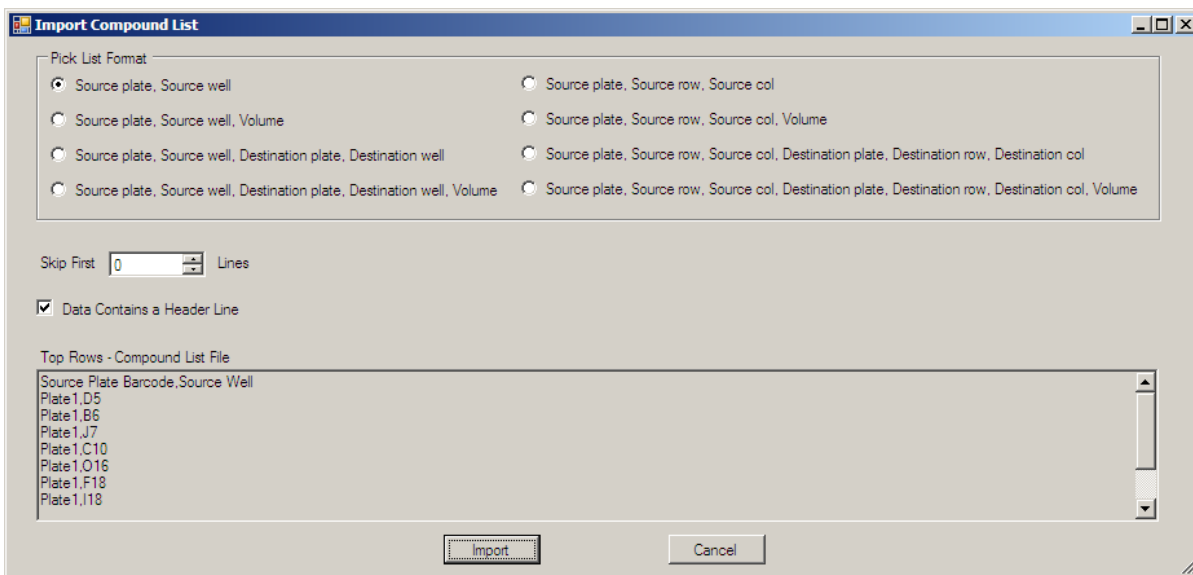


Figure 3-1: Import Compound List

Use the following guidelines to create pick lists that will work seamlessly in the Echo Cherry Pick software.

Pick list guidelines:

- Pick lists using row and column location must use the *one-based* coordinate system, which means that the first well in the upper left corner of the microplate is labeled row 1, column 1, or (1,1).
- Well IDs should be in uppercase letters and should not have a leading zero. For example: **A1** not **A01**.
- Pick list format must match one of the formats listed in the *Import Compound List* screen.
- Pick list must be saved in csv file format.*

The following sections describe the pick list formats and requirements in more detail.

* csv = Comma separated values, typically in spreadsheet files.

3.1.2 Pick List Formats

The pick list format identifies the data content and layout in the pick list. This information tells the Echo liquid handler how to process the compound transfer.

The *Pick List Format* window displays all of the supported formats.

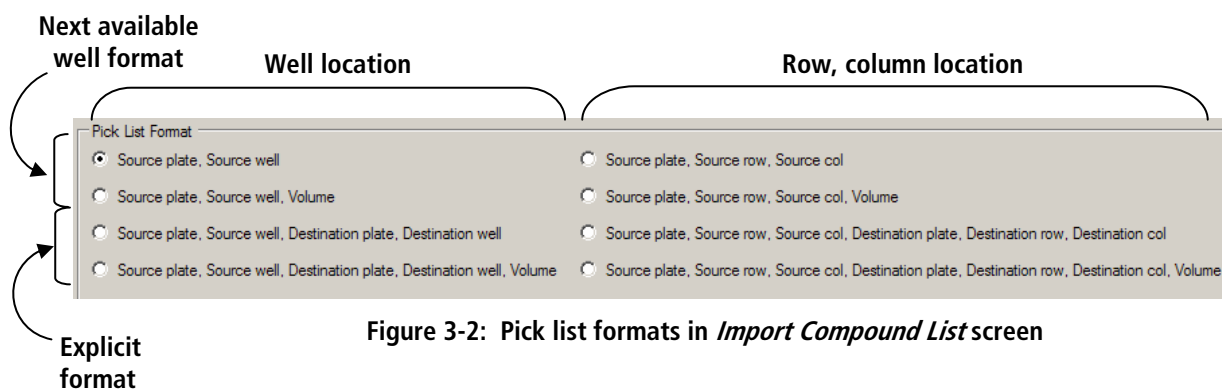


Figure 3-2: Pick list formats in *Import Compound List* screen

- **Next available well format:** The top four formats use the **Next available well** format. This format specifies the source well locations and allows the Echo liquid handler to fill compound into consecutive, available, destination wells.

Source Plate Barcode	Source Well	Source Plate Barcode	Source Row	Source Column
Plate1	D5	Plate1	4	5
Plate1	B6	Plate1	2	6
Plate1	J7	Plate1	10	7
Plate1	C10	Plate1	3	10
Plate1	O16	Plate1	15	16

Figure 3-3: Pick lists using next available well format

For example, it can be used when consolidating compounds from different source plates onto fewer destination plates, or replicating compounds over several destination plates. This method of filling the destination plates allows you to maximize plate space and randomize the placement of compounds. The pick list is also easier to design.

Protocol options, such as reserved wells, number of replicates, same or different plates, and fill direction are used to format the destination plates.

- **Explicit format:** The bottom four formats in the *Pick List Format* window use the **Explicit** format. This format specifies both source and destination well locations.

Source Plate Barcode	Source Well	Destination Plate Barcode	Destination Well
Plate1	D5	destPlate100	A2
Plate1	B6	destPlate100	A3
Plate1	J7	destPlate100	A4
Plate1	C10	destPlate100	A5
Plate1	O16	destPlate100	A6

Source Plate Barcode	Source Row	Source Column	Destination Plate Barcode	Destination Row	Destination Column
Plate1	4	5	destPlate100	1	1
Plate1	2	6	destPlate100	1	2
Plate1	10	7	destPlate100	1	3
Plate1	3	10	destPlate100	1	4
Plate1	15	16	destPlate100	1	5

Figure 3-4: Pick lists using explicit format

For example, it can be used if you need complete control over the placement of compounds and controls on the destination plate. This method of filling the destination plates allows you to vary transfer volumes or adhere to a particular destination plate design.

Since this format explicitly states the destination well location, it overrides the protocol options: reserved wells, replicates and fill direction. If the pick list includes transfer volume, then it also overrides the transfer volume in the protocol.

- **Well location:** The formats in the left column use standard microplate labeling to identify well location.
For example, the first well in the upper left corner of the microplate is A1, the second well in the same row is A2, and so on.
- **Row and column location:** The formats in the right column use row and column location. The Echo Cherry Pick software uses a one-based, row and column coordinate system to identify well location; for example, the first well in the upper left corner of the microplate is row 1, col 1, also shown as (1,1), the second well in the same row is (1,2), and so on.

The following table shows all of the supported pick list formats with sample data.

Table 1: Pick list formats

Format	Source Plate Barcode*	Source Well or (Row, Col)	Destination Plate Barcode*	Destination Well or (Row, Col)	Transfer Volume**	Transfer Location
Source plate, Source well or (row, col)	Plate 1	A1 or (1,1)		***	***	Next available well
Source plate, Source well or (row, col), Volume	H5412	B4 or (2,4)		***	5	Next available well
Source plate, Source well or (row, col), Destination plate, Destination well or (row, col)	Plate 5	G3 or (7, 3)	destPlate100	C2 or (3, 2)	***	Explicit
Source plate, Source well or (row, col), Destination plate, Destination well or (row, col), Volume	54654	C4 or (3,4)	39786	H6 or (8,6)	2.5	Explicit

*Source and destination plate fields can contain barcode data or plate ID.

**Transfer volume that is specified in the pick list.

***Uses values specified in the protocol.

The Echo Cherry Pick software is installed with three sample pick lists in the default directory: C:\Labcyte\Echo\Protocols. The samples are described below:

384-384_NextAvailableWell.csv: This is the simplest pick list and matches the first format in the *Pick List Formats* table (see table above). It specifies the source well barcode and location. It uses the Protocol settings to determine the number of replicates, transfer volume, and filling order. See the following figure.

Source Plate Barcode	Source Well
Plate1	D5
Plate1	B6
Plate1	J7
Plate1	C10
Plate1	O16
Plate1	F18
Plate1	I18
Plate1	J19
Plate1	G20
Plate1	B21
Plate3	N5

Figure 3-5: Pick list example, Next Available Well

384-384_Explicit.csv: This pick list is very explicit in specifying well locations, destination plate ID, and transfer volume. It matches the last format in the *Pick List Formats* table (see table on previous page). The information in this pick list overrides the protocol settings: any reserved wells in destination plate design, replicate data (must be set to 1), and fill direction. See the following figure.

Source Plate Barcode	Source Well	Destination Plate Barcode	Destination Well	Transfer Volume
Plate1	D5	destPlate100	A2	100
Plate1	B6	destPlate100	A2	90
Plate1	J7	destPlate100	A4	80
Plate1	C10	destPlate100	A5	70
Plate1	O16	destPlate100	A6	60
Plate1	F18	destPlate100	A7	50
Plate1	I18	destPlate100	A8	40
Plate1	J19	destPlate100	A9	30
Plate1	G20	destPlate100	A10	20
Plate1	B21	destPlate100	A11	10
Plate3	N5	destPlate100	B1	100
Plate3	L6	destPlate100	B2	90
Plate3	O7	destPlate100	B3	80
Plate3	C9	destPlate100	B4	70
Plate3	D12	destPlate100	B5	60
Plate3	D16	destPlate100	B6	50
Plate3	E19	destPlate100	B7	40

Figure 3-6: Pick list example, Explicit

384_Controls.csv: This pick list also matches the last format in the *Pick List Formats* (see table on previous page). It specifies the source plate barcodes, source and destination well locations, and transfer volume. It also specifies the number of replicates, transfer volume, and filling order. See Figure 3-7.

Source Plate Barcode	Source Well	Destination Well	Transfer Volume
Ctrl1	A1	A1	50
Ctrl1	A2	A24	100
Ctrl1	A3	P1	150
Ctrl1	A4	P24	200

Figure 3-7: Control Pick list example, Explicit

Note: Control pick lists always use the explicit format, the destination wells must be defined; therefore, they use a different pick list format window:

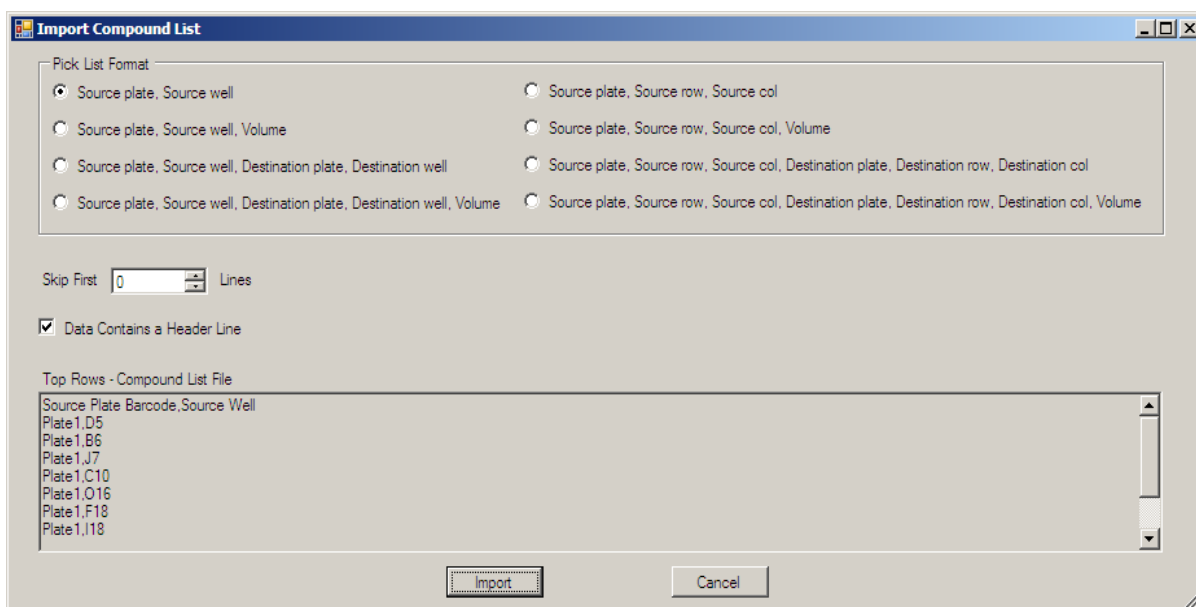
Control List Format	
<input type="radio"/> Source plate, Source well, Destination well	<input type="radio"/> Source plate, Source row, Source col, Destination row, Destination col
<input checked="" type="radio"/> Source plate, Source well, Destination well, Volume	<input type="radio"/> Source plate, Source row, Source col, Destination row, Destination col, Volume
<input type="radio"/> Source plate, Source well, Destination plate, Destination well	<input type="radio"/> Source plate, Source row, Source col, Destination plate, Destination row, Destination col
<input type="radio"/> Source plate, Source well, Destination plate, Destination well, Volume	<input type="radio"/> Source plate, Source row, Source col, Destination plate, Destination row, Destination col, Volume

3.1.3 Pick List Header Data

The Echo Cherry Pick software recognizes the following column headings:

- Source Plate Barcode
- Source Well (or Source Row, Source Column)
- Destination Plate Barcode
- Destination Well (or Destination Row, Destination Column)
- Transfer Volume

Use these column headings in your pick lists. When you import the pick list during protocol creation, the software will recognize the headings and display the *Import Compound List* window with the correct pick list automatically selected. The option *Data Contains a Header Line* is also automatically selected.



If you choose not to use these column headings, be sure to format the pick list data to match one of the pick list formats, particularly the column order; otherwise, the software will not know how to process the transfer data. See Figure 3-8.

Plate5	12	25	destPlate200	2	5	2.5
Plate5	2	2	destPlate200	2	6	2.5
Plate5	2	9	destPlate200	2	7	2.5
Plate5	4	10	destPlate200	2	8	2.5
Plate5	10	13	destPlate200	2	9	2.5
Plate5	10	15	destPlate200	2	10	2.5

Figure 3-8: Pick List format 4b without header line.

When you import the pick list without header line, the software will prompt you to select the matching plate list format.

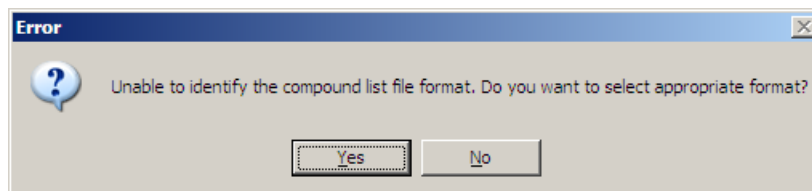


Figure 3-9: Import pick list error

Skip First Lines

Your pick list can contain heading data (for example, assay information, date, etc.), but it should be skipped when you import it.

You can use the option **Skip First Lines** in the *Import Compound List* screen to skip all heading lines except for the column headings (header line). The preview box **Top Rows - Compound List File** shows the heading data in the imported pick list. The software updates the data in the preview box as you skip header lines.

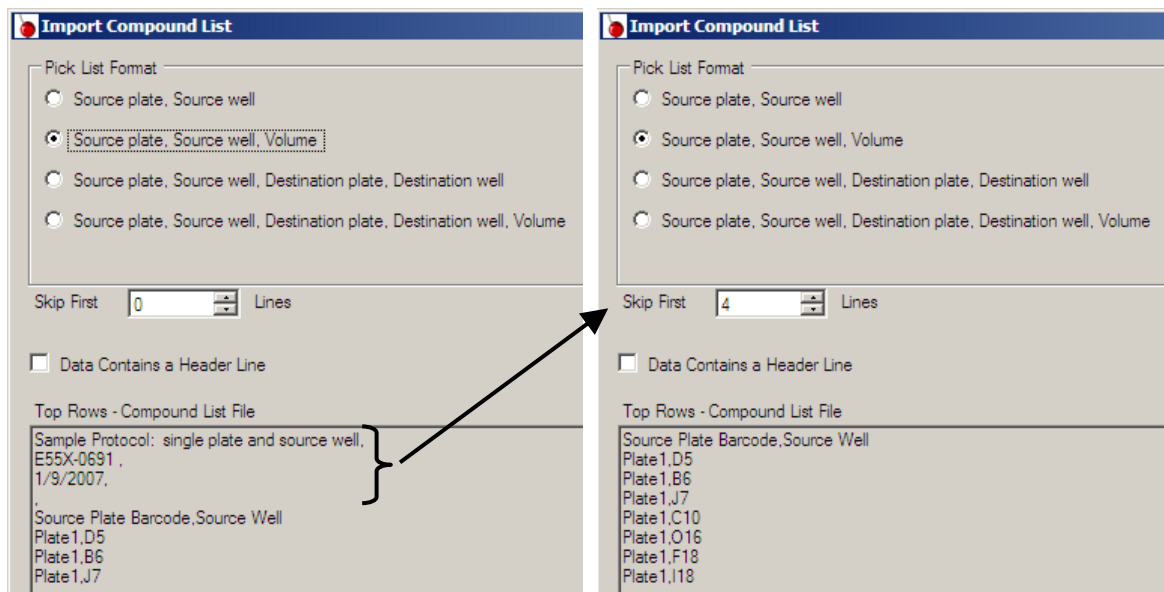


Figure 3-10: Pick list with additional header lines

Data Contains a Header Line

If your pick list contains a header line (column headings), select this option. Also, select the correct pick list format (the software makes a best guess). See the right screen in Figure 3-10.

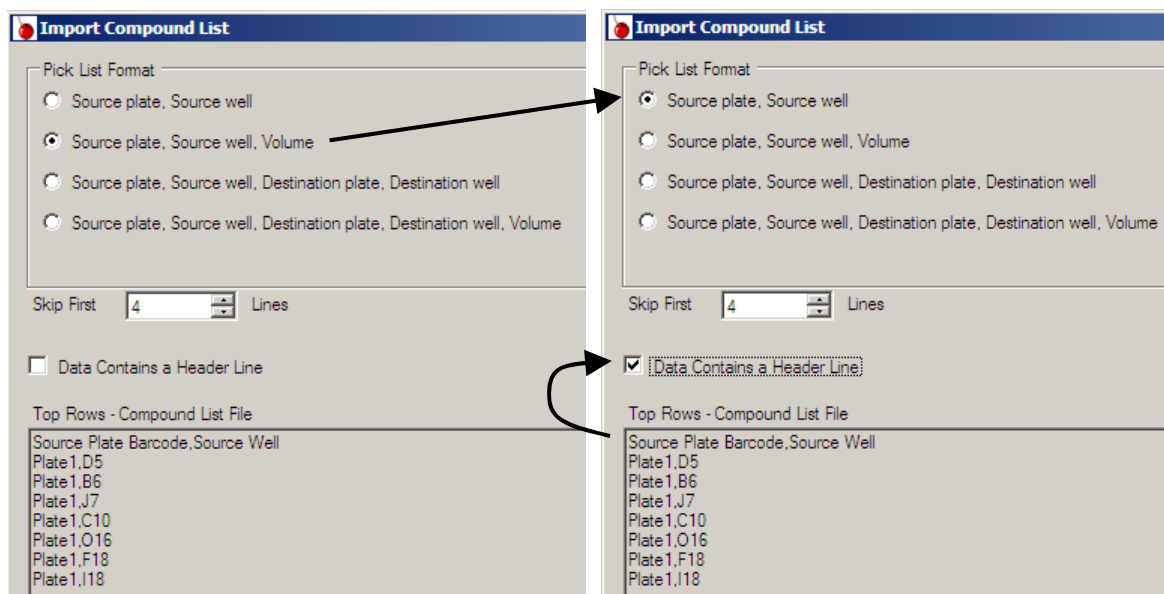


Figure 3-11: Pick list with header line and corrected format selection

3.1.4 Pick list file format

When your pick list is complete, save it in CSV (comma separated values) file format.

In your spreadsheet program, look for the **Save as** menu and select **CSV (comma delimited) (*.csv)**. This is the file format that the Echo Cherry Pick software recognizes when you import pick lists.

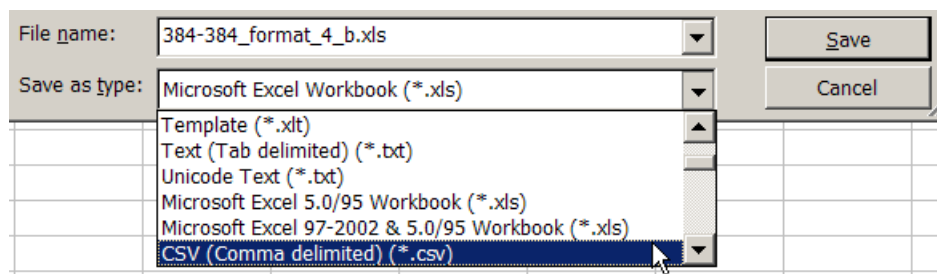



Figure 3-12: Saving to .csv file format

3.2 Set up the Transfer Protocol

The Echo Cherry Pick software is very flexible. It enables you to pick compounds from any well position in your source plate and transfer them any well position in your final assay plates. You can transfer from 384- or 1536-well Echo qualified source plates to 96-, 384-, 1536-, or 3456-well assay plates.

To create a transfer protocol:

1. Click the new protocol icon  in the toolbar at the top of the screen, or select **New** from the *File* menu to open a new Protocol template.

The new protocol template opens in the *Main Window*.

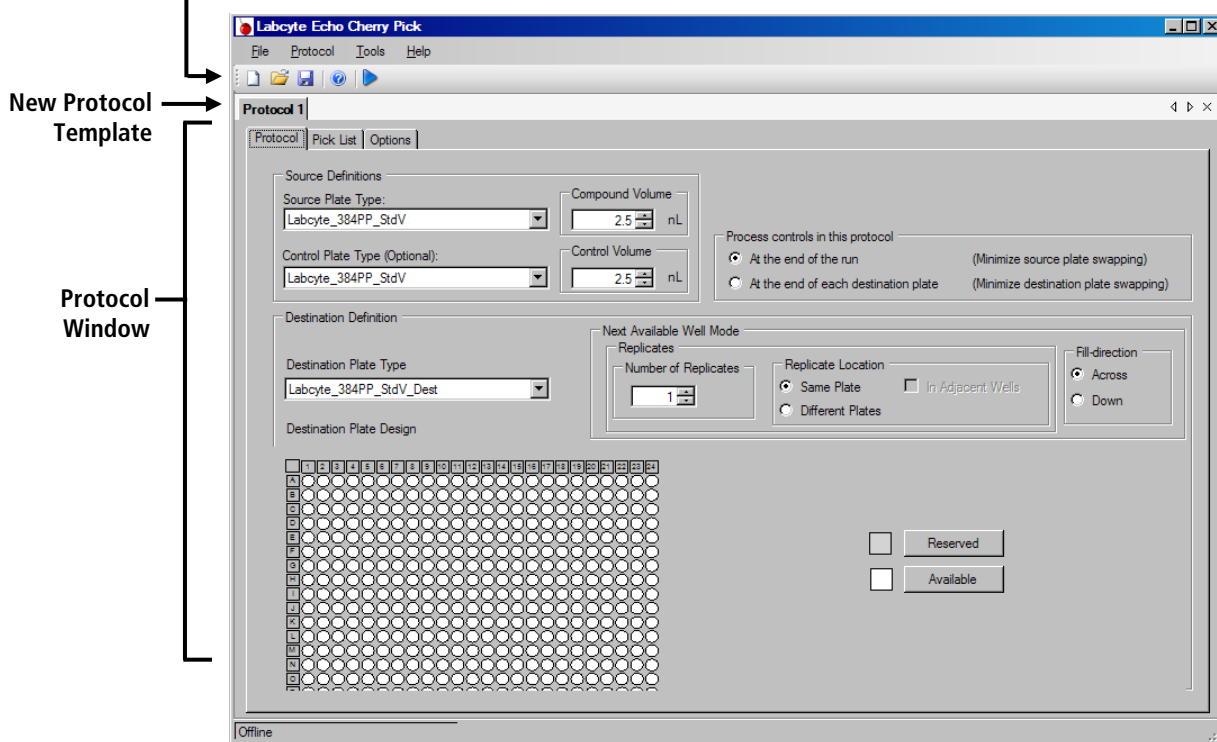
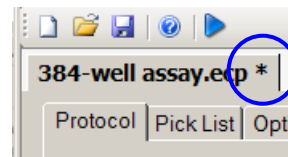


Figure 3-13: New protocol

The new protocol is temporarily labeled "Protocol 1" until you save it.

2. Select **Save** from the *File* menu and enter a file name in the prompt box. The protocol is saved with the file extension ".ecp" in the default directory **C:\Labcyte\Echo\Protocols**. You can save the file to different directories.

As you enter information in the template, an asterisk appears next to the file name. This is a reminder that the file has information that has not been saved. Save the protocol periodically as you work on it.



Note: The saved protocol does not retain imported pick lists, since they are not valid across transfer runs.

3. Select a source plate type for compounds and controls (optional) from the drop-down menu. Enter the compound and control transfer volumes. These transfer volumes will be used if the pick list does not specify transfer volumes.

Figure 3-14: Source and Control Plate Definitions

4. If you are using controls, choose one of the following options for the time to add controls to your destination plates.

Figure 3-15: Control processing order

- ◆ Select **At the end of the run** if you want to process all pick list plates first (for example, to minimize the time that the plates are out of storage).
 - ◆ Select **At the end of each destination plate** if you want to add controls to each destination plate, but also need to process the destination plate as soon as possible (for example, to transport the plate to a controlled environment).
5. Select a destination plate type from the drop-down menu.
 6. If reserve wells are needed, select wells in the destination plate map and click the **Reserve** button. The software will skip over the reserved wells during compound transfer.

Figure 3-16: Reserved Wells

Note: Reserved wells will be ignored if the destination wells are defined in the pick list (Explicit format). See description of Explicit format on page 20.

7. Enter the information in the **Next Available Well Mode** box:

The screenshot shows a software dialog box titled "Next Available Well Mode". It is divided into three main sections. The first section, "Replicates", contains a "Number of Replicates" spinner box with the value "5". The second section, "Replicate Location", has two radio buttons: "Same Plate" (which is selected) and "Different Plates". There is also an unchecked checkbox labeled "In Adjacent Wells". The third section, "Fill-direction", has two radio buttons: "Across" and "Down" (which is selected).

- ◆ Specify the number of replicates for each compound well.
- ◆ Specify whether the replicates must be in the same plate or in different plates. If the replicates are in the same plate, you can select the option to place the replicates **In Adjacent Wells**.
- ◆ Specify the fill direction on the destination plate.

Notes:

- Settings for the *Next Available Well Mode* apply only when the destination wells are not defined in the pick list.
- If the imported compound pick list has destination wells defined (Explicit format), then the number of replicates must be set to **1**; otherwise, the software will display a message that prompts you to reset the replicate number. The other settings in the *Next Available Well Mode* box will be ignored.

See "Create Pick Lists" on page 18 for information on *Next Available Well* and *Explicit* pick list formats.

3.3 Import Compound and Control pick lists

You can import compound and control pick lists from the *Pick List* window or from the *Run Options* window. The *Pick List* window gives you options to edit the pick list and preview the plate maps.

1. **Open the *Pick list* window.** Click the **Pick list** tab to display the import and editing windows for compound and control pick lists.

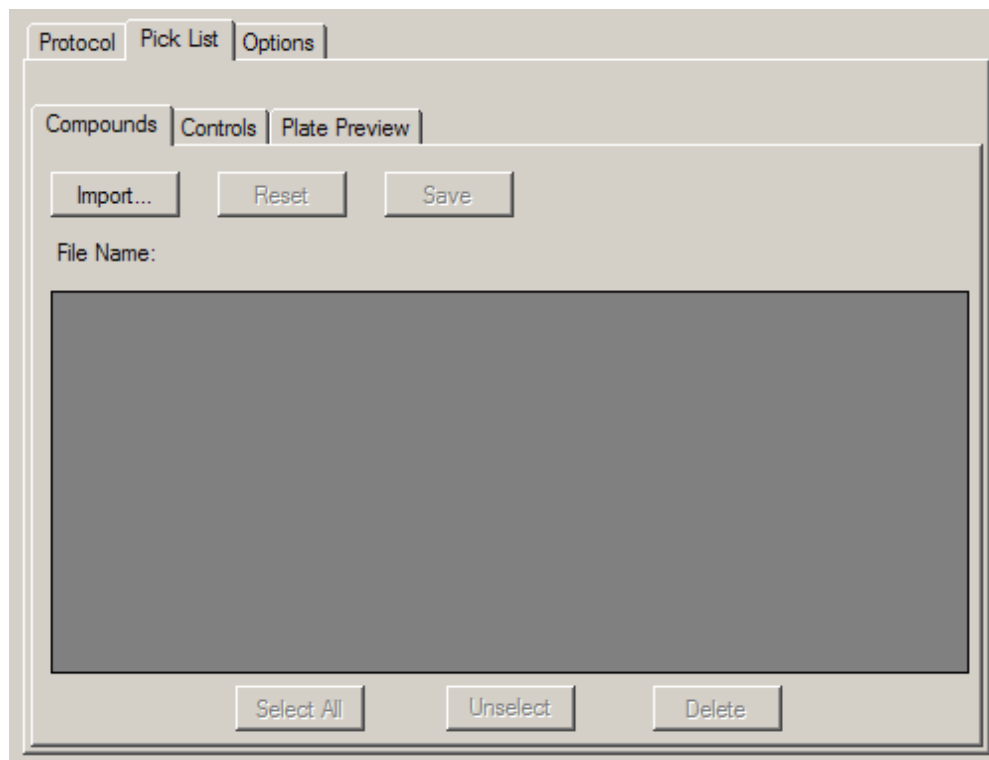


Figure 3-17: Pick list windows

Three windows are available in the *Pick List* window:

- ♦ **Compounds window**— provides an import button and text box to import, edit, save, or delete the compound pick list.
- ♦ **Controls window** — provides an import button and text box to import, edit, save, or delete the control pick list.
- ♦ **Plate Preview window** — displays source and destination plate layouts that are based on the imported pick lists and protocol settings.

2. Import the compounds pick list.

- a. Click the **Import** button in the *Compounds* window.
- b. Browse to the folder that contains the compound pick list and open the pick list you want to import.

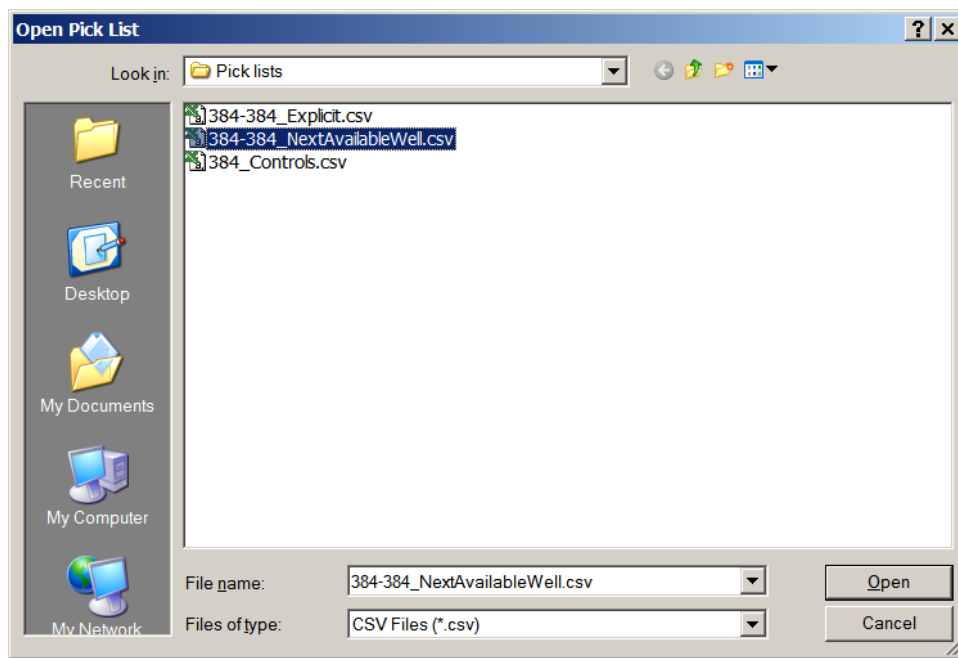


Figure 3-18: Select pick list

- If the pick list contains the column headings that the software recognizes (see *Pick List Header Data* on page 23), the software displays the *Import Compound List* window with the correct pick list format selected. Continue to step c.
- If the pick list contains extra header lines, no header lines, or header lines that the software does not recognize, the software displays an error message. See Figure 3-19.

Click **Yes** to continue to the *Import Compound List* window.

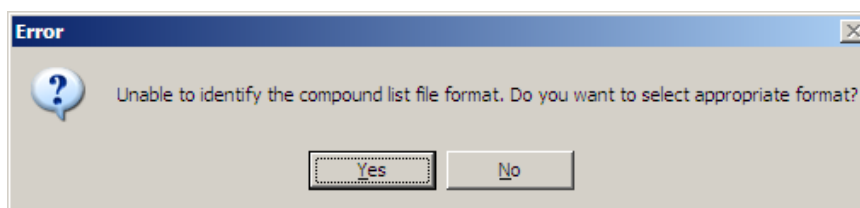


Figure 3-19: Import pick list error message

- c. In the *Import Compound List* window, select the format that matches the pick list you are importing, if it is not already selected.

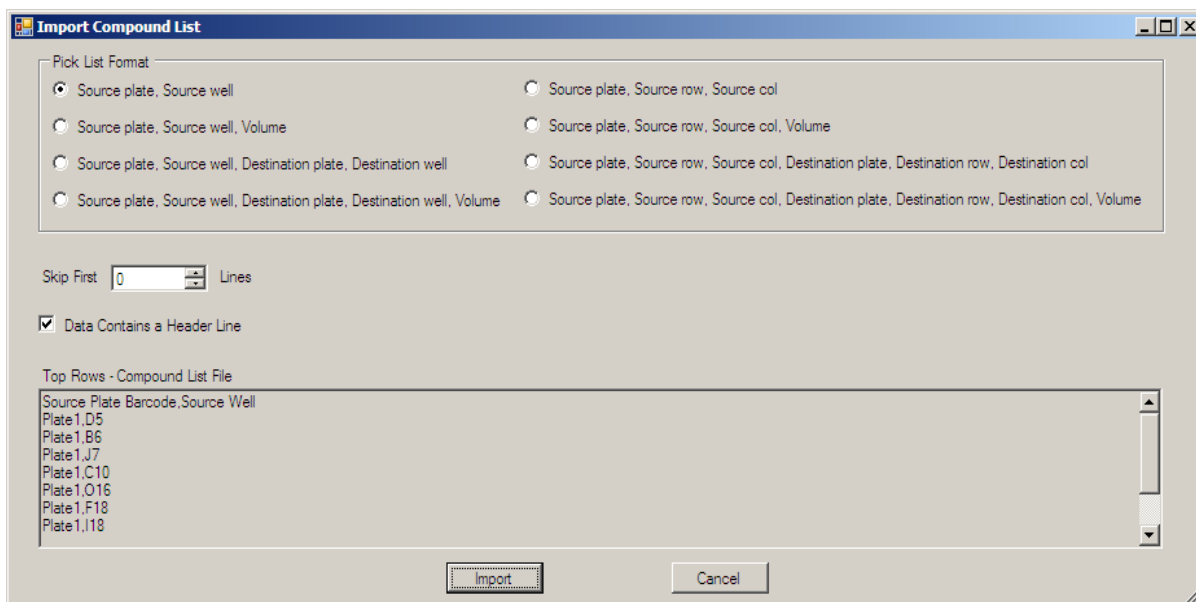


Figure 3-20: Select compound pick list format

- d. Specify the number of lines to skip if the pick list contains other header data. See *"Skip First Lines"* on page 24 for more information.

Use the *Top Rows* preview box to help you determine how many header rows to skip. When you enter the number of lines to skip, the corresponding rows in the *Top Rows* box will be removed from the file preview.

Note: The rows are NOT deleted from the pick list—they are ignored by the software when the protocol is run.

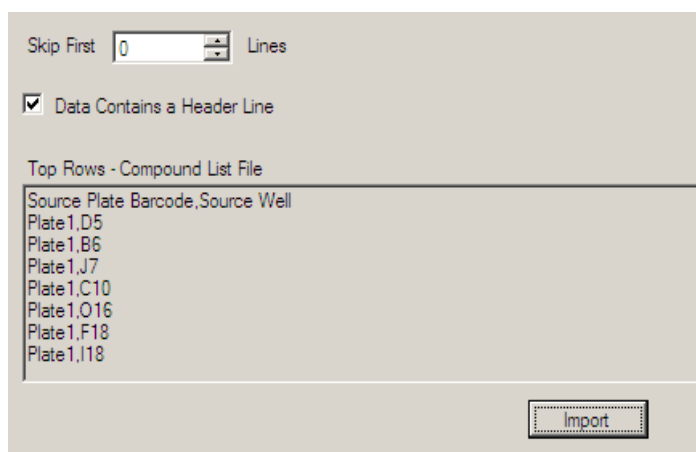


Figure 3-21: Specify lines to skip

- e. Indicate if the pick list contains a header line (column headings). See *"Data Contains a Header Line"* on page 25 for more information.
- f. Click the **Import** button to open the pick list in the *Compound* window below the file name. See Figure 3-22. If you need to edit the pick list, see *"Edit window"* on page 53 for instructions.

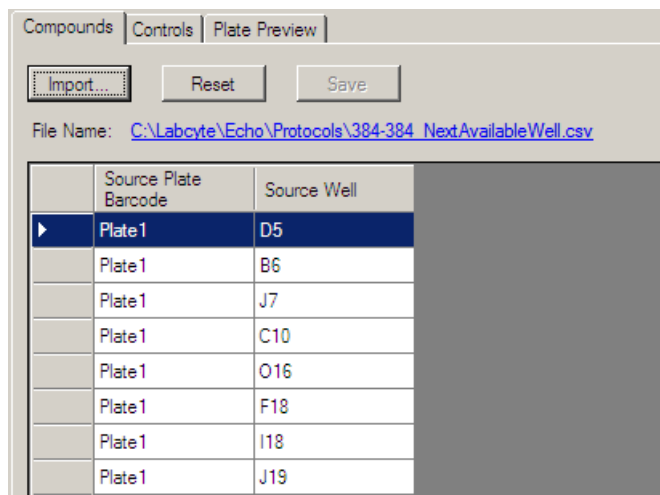


Figure 3-22: Pick list in Compound window

3. Import the control pick list (optional).

- a. Click the **Controls** tab in the *Pick List* window.
- b. Click the **Import** button in the *Controls* window.
- c. Browse to the folder that contains the control pick list and select the pick list you want to import.
 - If the pick list contains the column headings that the software recognizes (see *"Pick List Header Data"* on page 23), the software displays the *Import Control List* window with the correct pick list format selected. Continue to step d.
 - If the pick list does not contain column headings, or the software does not recognize the headings, the software displays an error message. Click **Yes** to open the *Import Control List* window.

- d. In the *Import Control List* window, select the format that matches the pick list you are importing, if it is not already selected.

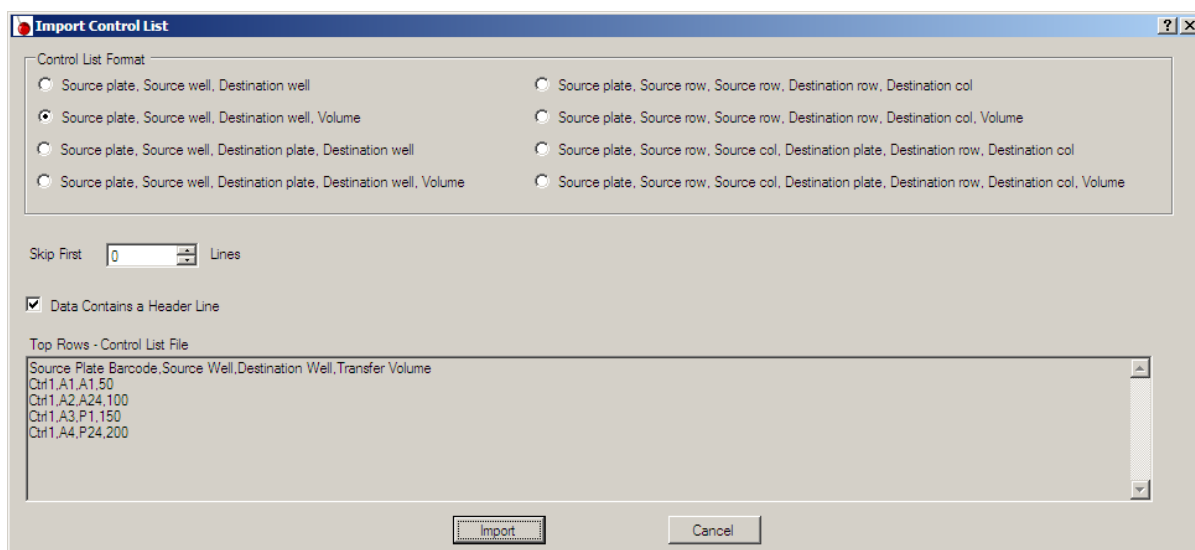


Figure 3-23: Select control pick list format

The *Import Control List* window differs slightly from the *Import Compound List* window—the destination well location is always specified.

- If the compound pick list uses the *Explicit* format (destination plate is specified), then the control pick list must also specify the destination plate.
 - If the compound pick list uses the *Next Available Well* format (destination plate is not specified), then the control pick list should not specify the destination plate. The software will add controls to every destination plate that is created to hold the compounds.
- e. In the *Import Control List* window, specify the number of lines to skip if the pick list contains other header data. See “*Skip First Lines*” on page 24 for more information.
- Use the *Top Rows* preview box to help you determine how many header rows to skip.
- f. Specify the number of lines to skip if the pick list contains other header data.
- g. Indicate if the pick list contains a header line (column headings).
- h. Click the **Import** button to open the pick list in the *Control*/text box. If you need to edit the pick list, see “*Edit window*” on page 53 for instructions.

4. Preview the source and destination plates.
 - a. Click the **Plate Preview** tab to display the layout for the source and destination plates. The color legend helps you identify the components on the plate maps. See Figure 3-24.

The *Plate Preview* function is a useful tool for designing the layout of the destination plate. If you make changes to the protocol (for example, increase replicates or change processing order), the *Plate Preview* window will display those changes.

- b. Use the arrow keys to look at different source plates.

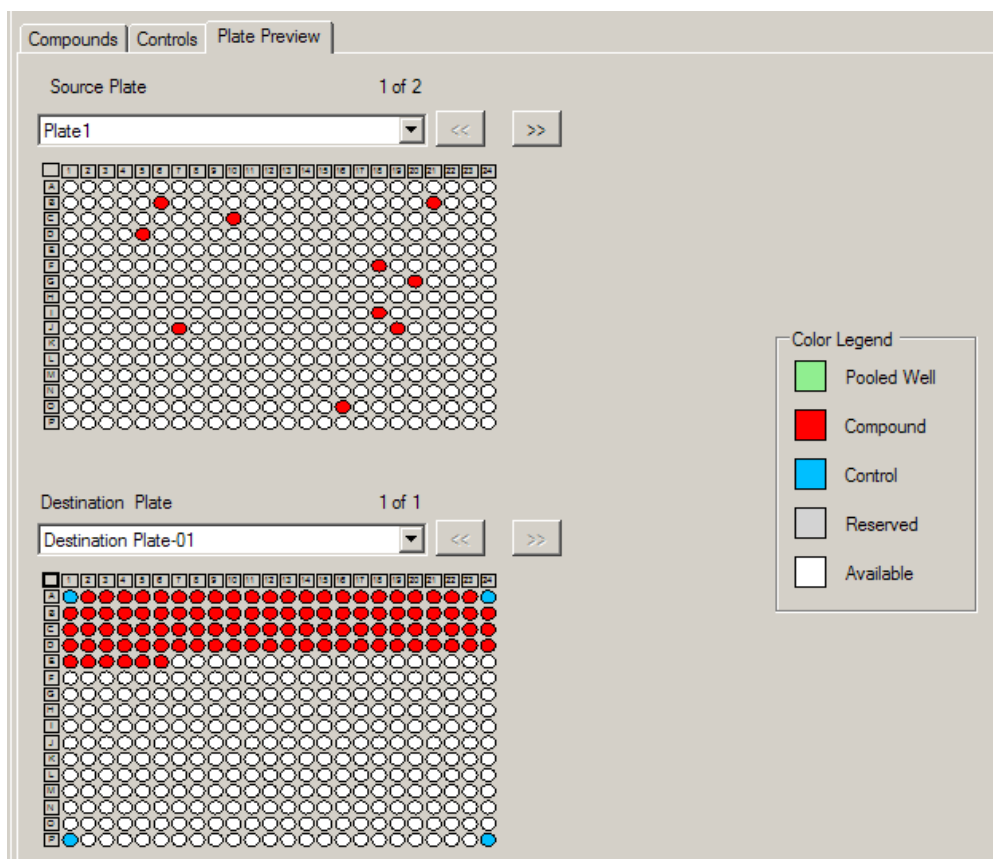


Figure 3-24: Plate Preview

3.4 Run a Simulation

Run a simulation to test the protocol before performing the actual liquid transfer. The simulation enables you to fix protocol or run errors before committing compounds and controls to the liquid transfer.

To run a protocol simulation:

1. Click the **Run** icon  or select **Run** from the *Protocol* menu to open the *Run Options* window.

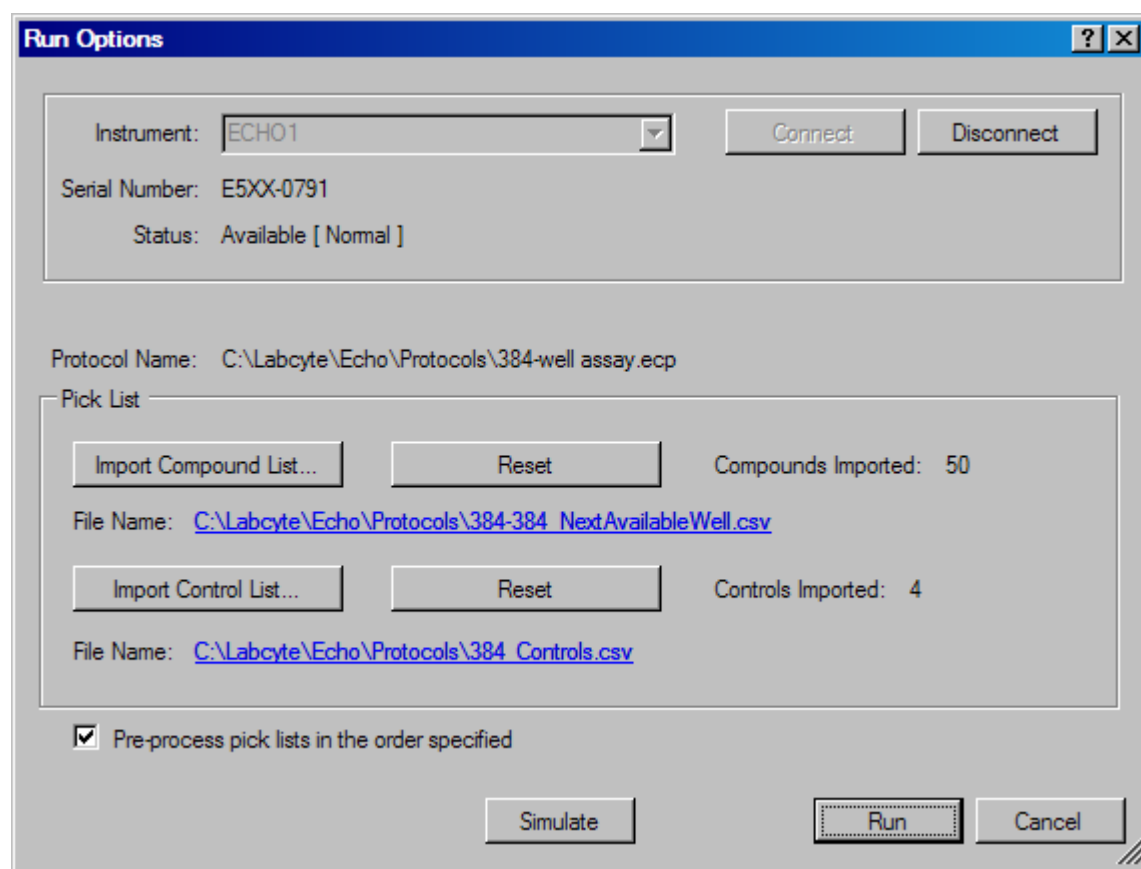
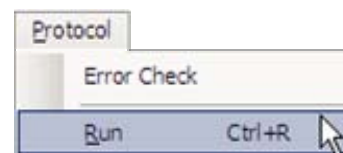


Figure 3-25: Run Options window

- ♦ If you previously imported pick lists, this window will display the pick list file name and number of compounds or controls that were imported.
 - ♦ If you decide to import different pick lists, you can click the **Reset** button to remove the current pick list, and then click the **Import Compound List** button to import a different pick list.
2. Click the **Simulate** button to open the *Simulator* window.

3. Click the **Play** button (lower right corner of the window) to start the simulator. During the simulation you have the option to skip the animation (to move quickly to the end) or cancel it.

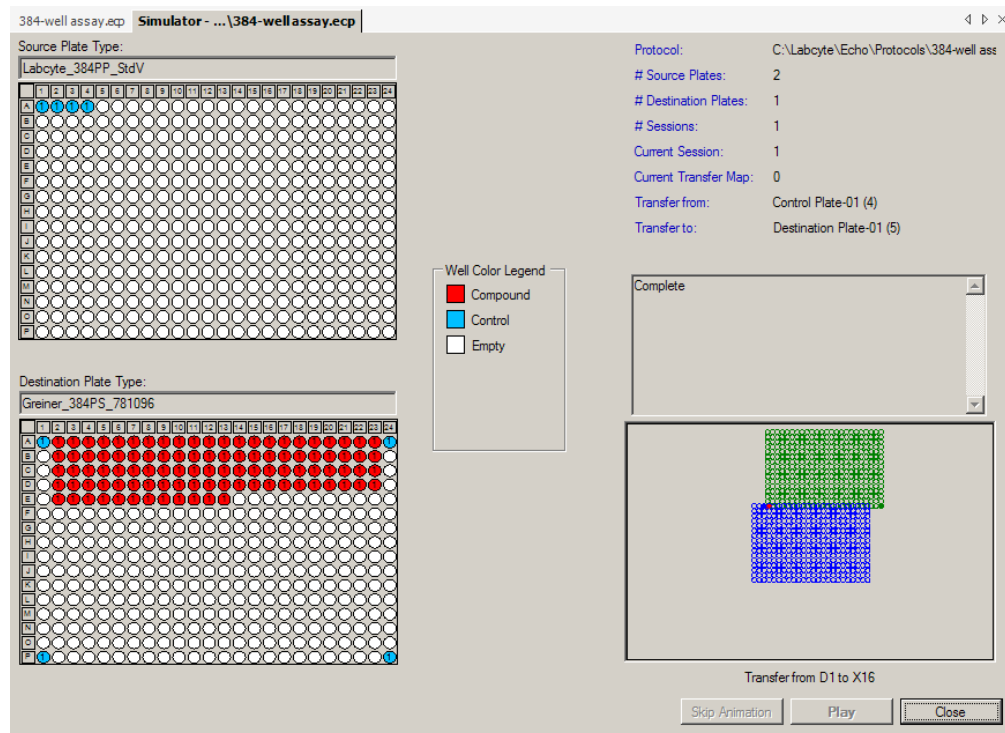


Figure 3-26: Transfer Simulation

For an in-depth discussion of the simulator program, see "Simulator window " on page 66.

3.5 Set up Plates

1. Use the pick lists you created to assemble the source plates containing the compounds and controls you will be transferring.

Note: The compound and controls must be in Echo qualified source plates.

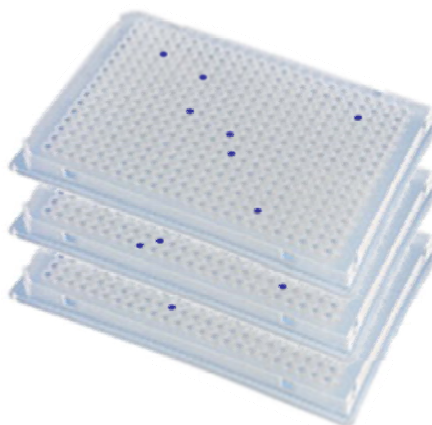


Figure 3-27: Assemble source plates

2. Determine the number of destination plates that you will need. If you are not sure, refer to the destination plate data from the plate preview or simulated run.

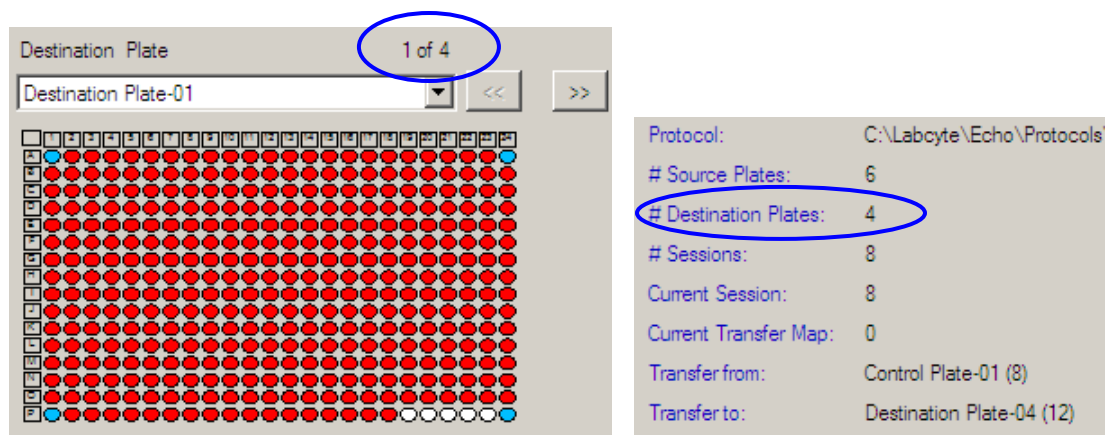



Figure 3-28: Determine number of destination plates needed

When your plates are ready for the transfer, continue to the next section to run the transfer protocol.

3.6 Run a Protocol

After you have created a transfer protocol and tested it in the software simulator, you are ready to run the protocol on an Echo liquid handler:

1. Click the **Run** icon  or select **Run** from the *Protocol* menu to open the *Run Options* window.

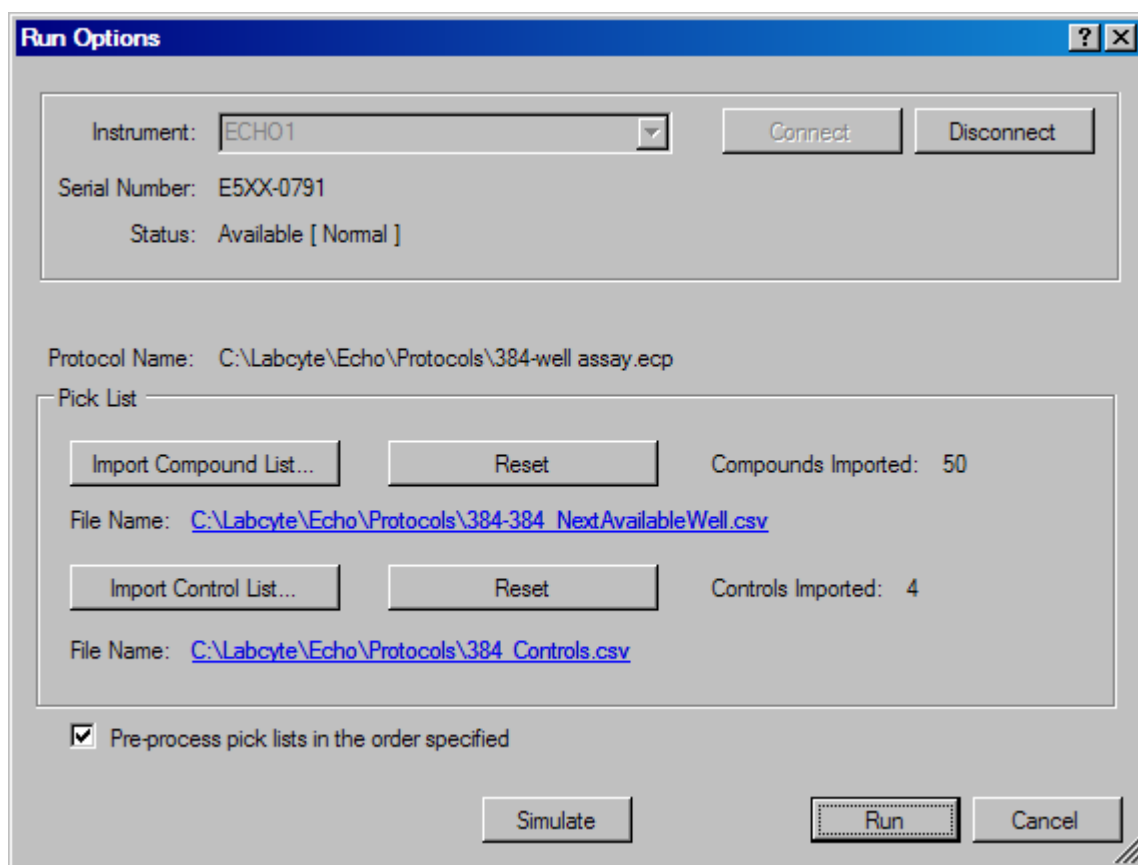
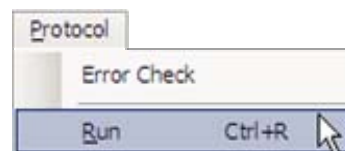


Figure 3-29: Run Options window

2. Connect to the Echo instrument, if you are not already connected.
3. Import your pick list, if you did not import it previously or if you need to change the current selection.

4. Determine if you want to pre-process the pick list.
 - ◆ Select the **Pre-process pick list** option when you want the software to prompt you for the source plate in the order that is specified in the pick list. The software processes the plate barcode or ID data in the pick list at the beginning of the run, and then prompts you for the correct source plate during the run. The *Barcode* field is disabled. You can only select (or deselect) the **Verify Barcode** option.

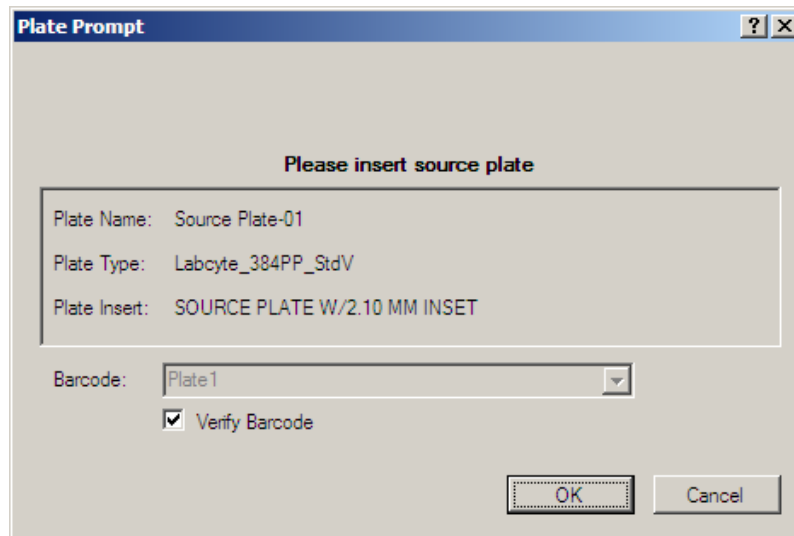
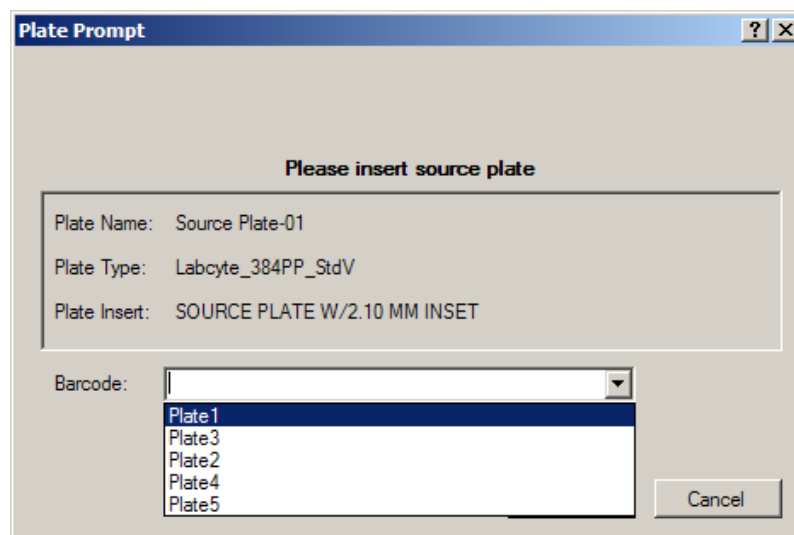


Figure 3-30: Run Options window

- ◆ Deselect the **Pre-process pick list** option when you want to control the source plate selection during the run. In the following screen, you can either select a plate from the drop-down menu or select **Verify Barcode** and insert the plate. The Echo instrument will automatically scan the barcode on the plate and insert the data in the *Barcode* field.



The **Pre-process pick list** option is **OFF** (deselected) initially, then the last setting is retained.

- Click the **Run** button to open the *Run Status* window.

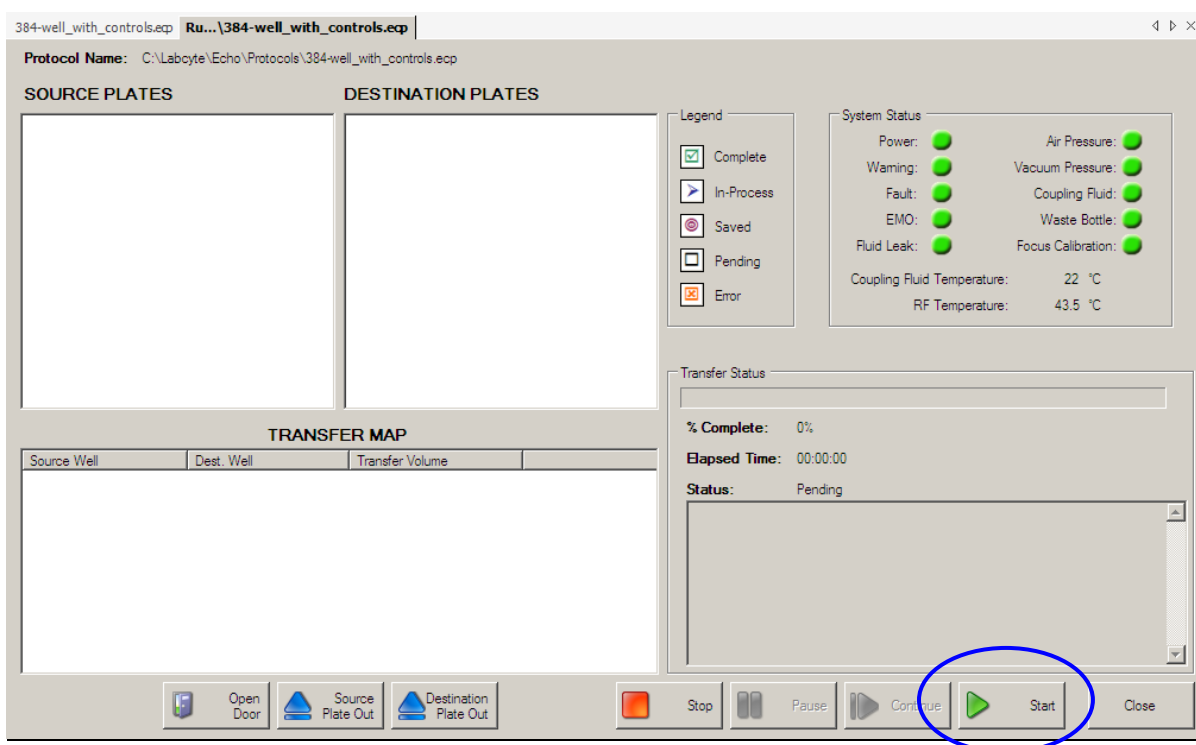


Figure 3-31: Run Status Window

- Click the **Start** button to begin the transfer protocol.
The software displays a prompt window to select the first source plate to be used in the transfer.

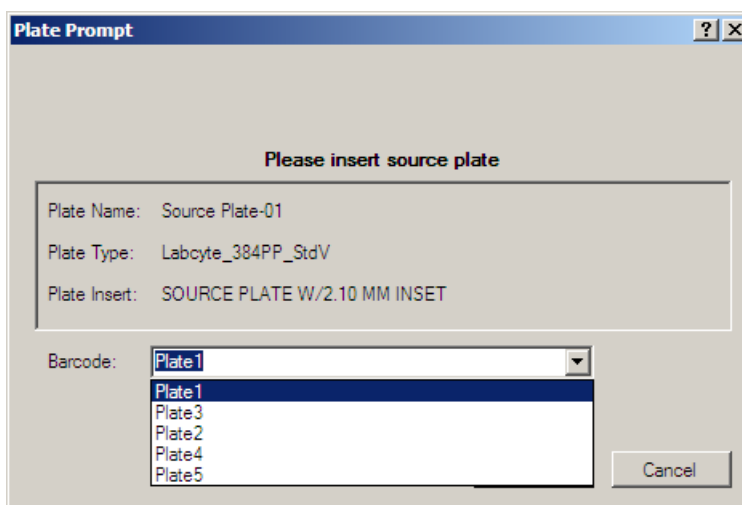


Figure 3-32: Plate Prompt

7. Follow the software prompts for each plate until the transfer is done.

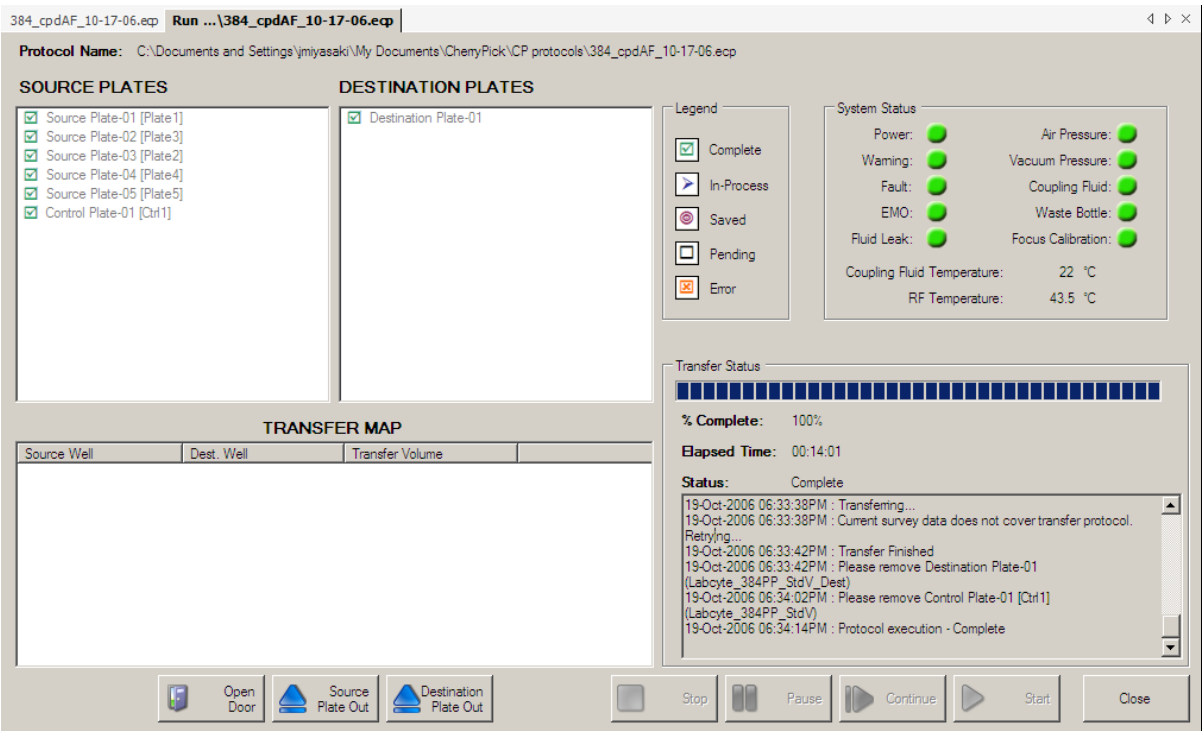


Figure 3-33: Transfer Completed

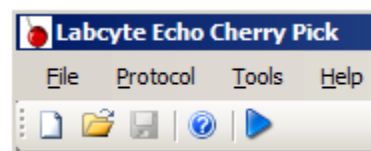
4 Software Reference

This chapter contains descriptions of all the Echo Cherry Pick software screens. This information and procedures for each screen are available in the Echo Cherry Pick online Help.

4.1	Toolbar	43
4.2	Protocol	44
	4.2.1 Source Plate Definition	44
	4.2.2 Destination Definition	44
4.3	Labware Definitions	46
	4.3.1 Plate Type List	46
	4.3.2 Plate Type Editor	48
	4.3.3 Plate Export	51
4.4	Pick List	52
	4.4.1 Compounds and controls window	52
	4.4.2 Plate Preview window	54
	4.4.3 Import Compound and Control List windows	55
4.5	Protocol Options	56
	4.5.1 Survey History	57
	4.5.2 Output Files	59
	4.5.3 File Type	59
4.6	Preferences	64
4.7	Run Protocol	65
4.8	Simulator window	66
4.9	Run Status window	70

4.1 Toolbar

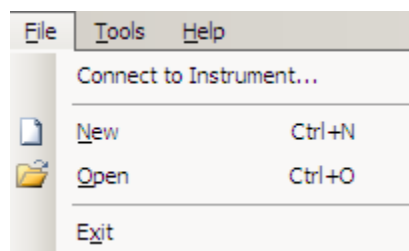
The **Toolbar** contains the *File*, *Protocol** *Tools*, and *Help* menus, as well as individual icons for frequently-used functions.



From the *Toolbar*, you can perform the following functions:

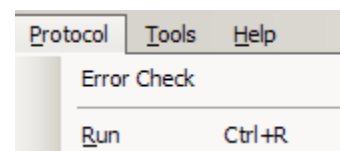
File menu

- ♦ **Connect to instrument:** Select an Echo instrument to connect to the software
- ♦ **New:** Create a new transfer protocol
- ♦ **Open:** Open an existing transfer protocol
- ♦ **Save:*** Saves the current transfer protocol
- ♦ **Save As:*** Copies the current transfer protocol to a different file name
- ♦ **Exit:** Closes the Echo Cherry Pick software.



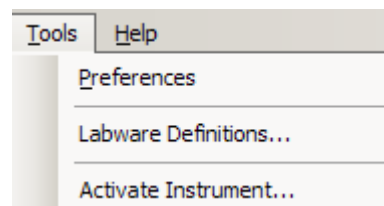
Protocol menu*

- ♦ **Error Check:** Checks the protocol for inconsistent information
- ♦ **Run:** Executes the transfer protocol that is displayed.



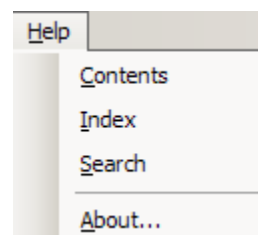
Tools menu

- ♦ **Preferences:** Set survey, output, and report options for all protocols.
- ♦ **Labware definitions:** Manage existing labware definitions or add new definitions.
- ♦ **Activate the instrument:** Enter software license key to use the Echo Cherry Pick software on each Echo instrument.



Help menu

- ♦ **Contents:** View the Help table of contents.
- ♦ **Index:** Search Help through available key words.
- ♦ **Search:** Search Help through words or phrases.
- ♦ **About:** Display the version number of the Echo Cherry Pick software.



* Available only when a protocol is open.

4.2 Protocol

The Protocol window displays the following information:

The screenshot shows the 'Protocol' window with two main sections: 'Source Definitions' and 'Destination Definition'. The 'Source Definitions' section includes 'Source Plate Type' (Labcyte_384PP_StdV), 'Compound Volume' (2.5 nL), 'Control Plate Type (Optional)' (Labcyte_384PP_StdV), and 'Control Volume' (2.5 nL). It also has 'Process controls in this protocol' with radio buttons for 'At the end of the run' (Minimize source plate swapping) and 'At the end of each destination plate' (Minimize destination plate swapping). The 'Destination Definition' section includes 'Destination Plate Type' (Labcyte_384PP_StdV_Dest), 'Destination Plate Design' (a grid of circles), 'Next Available Well Mode' (Number of Replicates: 3, Replicate Location: Same Plate, In Adjacent Wells), and 'Fill Direction' (Across, Down). There are also 'Reserved' and 'Available' buttons at the bottom right.

Figure 4-1: Protocol window

4.2.1 Source Plate Definition

- **Source Plate Type and Compound Volume.*** Defines the source plate type used in the protocol and the compound volume.
- **Control Plate Type and Control Volume*** (optional). Defines the source plate type used for controls in the protocol, the control volume, and the processing order of the controls:
 - ♦ **At the end of the run** to minimize swapping of the source plate.
 - ♦ **At the end of each destination plate** to minimize swapping of the destination plate.

4.2.2 Destination Definition

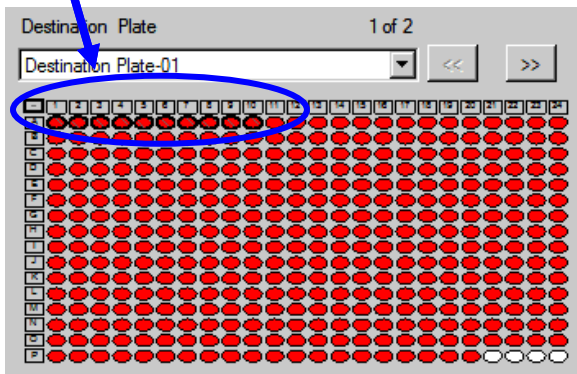
- **Destination Plate Type.** Defines the destination plate type and plate design for this protocol:
- **Next Available Well Mode:** Defines the destination plate layout and fill direction for compounds and replicates
 - ♦ **Number of Replicates:**** number of copies of each compound (for example, 10 replicates means that each compound in the source plate will be transferred to 10 wells in the destination plate (**Same Plate** for all compounds that will fit on the plate or **Different Plate** for each compound and its replicates).

* If this data is specified in the pick list, it will override the data specified in the protocol.

** If the imported pick list is **explicit**, (contains destination plate data), the number of replicates must be set to 1.

- ♦ **Replicate Location:** defines how replicates are laid out on the destination plates: **side-by-side** (in adjacent wells option) or **spread out** over the plate.

Replicates for compound 1 in adjacent wells.



Replicates for compound 1 staggered across plate.

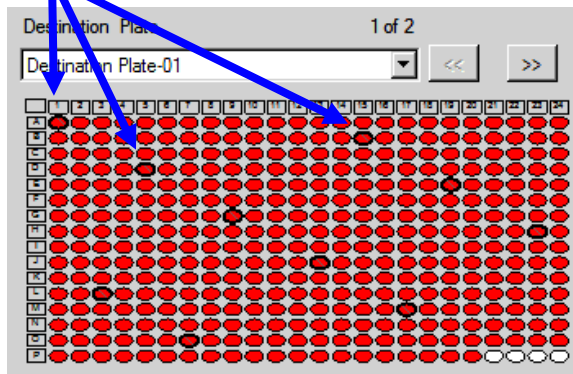


Figure 4-2: Replicate location

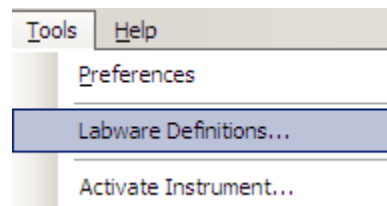
- ♦ **Fill direction:** direction that the compound will be transferred to the destination plate, either across the plate or down the plate.

Note: The software determines the number of destination plates that are needed to hold all compounds and their replicates. If a destination plate has insufficient wells to fill a compound and its replicates, then the compound and its replicates are moved to the next destination plate. The location of the resulting empty wells will depend on the fill direction (last column or row).

- **Destination Plate Design:** plate template that allows you to block wells from receiving compound.

4.3 Labware Definitions

The Echo Cherry Pick software relies on the labware definitions resident in the Echo liquid handler database. You can add new plate definitions or manage the existing ones by selecting **Labware Definitions** from the **Tools** menu.



4.3.1 Plate Type List

The *Plate Type List* window enables you to add new plate definitions or manage the existing ones.

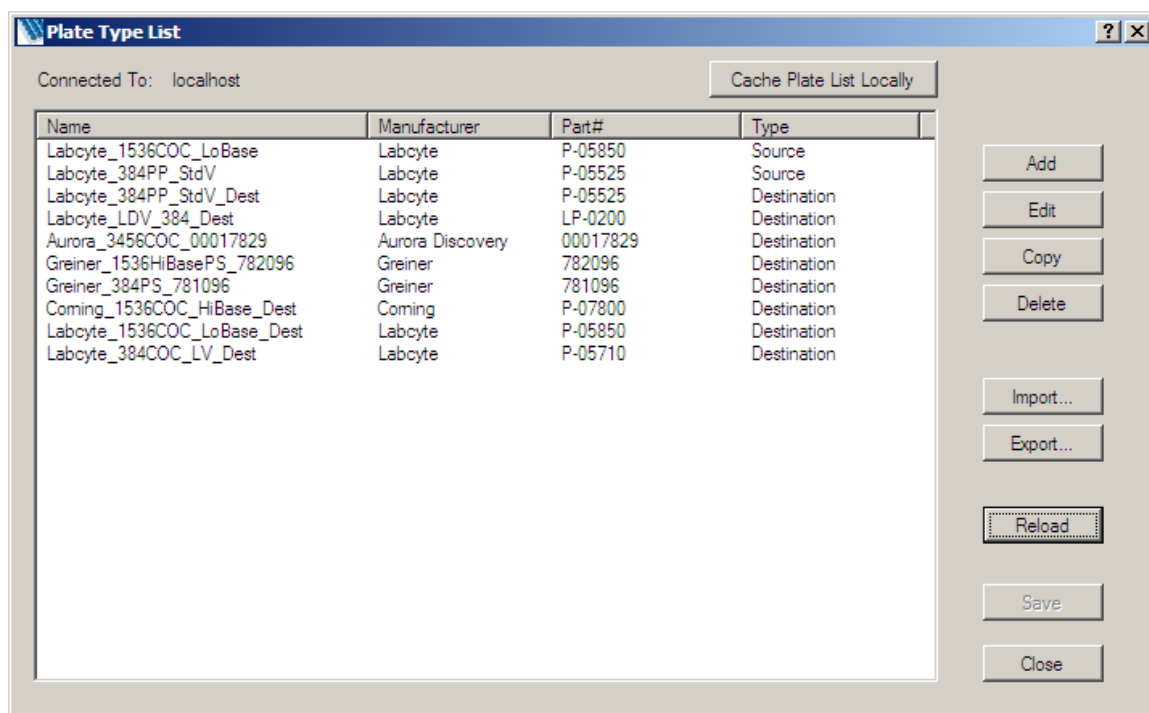


Figure 4-3: Plate Type List

Note: If you have received an error message followed by a blank Plate Type List, you will need to connect to an Echo liquid handler or import the labware file from the Echo liquid handler directory.

Command Buttons:

- **Cache Plate List Locally.** Click this button to save the plate list from the Echo liquid handler to the Echo Cherry Pick software.
- **Add** a plate definition. Only a destination plate can be added. Refer to one of the following options:
 - ◆ Add a labware definition from the Echo Cherry Pick software
 - ◆ Add a plate definition from the Echo liquid handler software and reload the updated labware definition to the Echo Cherry Pick software.
- **Edit** a plate definition. Select a plate definition and click the **Edit** button.
 - ◆ Source plate definition: Only the barcode location of the source plate can be edited.
 - ◆ Destination plate definition: Edit any setting in the definition.
- **Copy** a plate definition. Select a plate definition and click the **Copy** button. You can copy a source or destination plate definition to create a destination plate definition.
- **Delete** a plate definition. Select a plate definition and click the **Delete** button. You can delete a destination plate definition but not a source plate definition.
- **Import** a single plate definition or group of definitions from a specific file location. The file must have an `.elw` extension to be imported.
- **Export** a single plate definition or group of definitions. See *"Plate Export"* on page 51 for more information.
- **Reload** the plate types that have been edited or deleted since the plate type list was last saved.
- **Save** any changes you make to the plate type list, such as adding a new plate definition.
- **Close** the *Plate Type List* window.

4.3.2 Plate Type Editor

The *Plate Type Editor* window is similar to the *Plate Specification* window in the Echo liquid handler software.

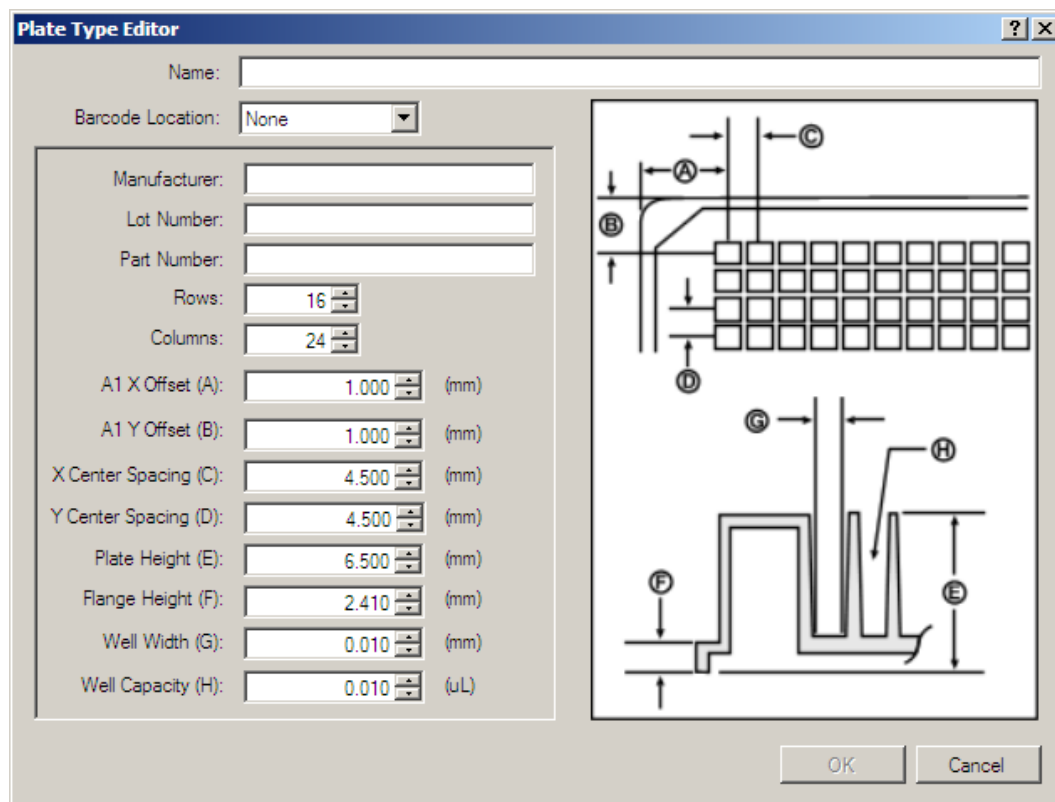


Figure 4-4: Plate Type Editor

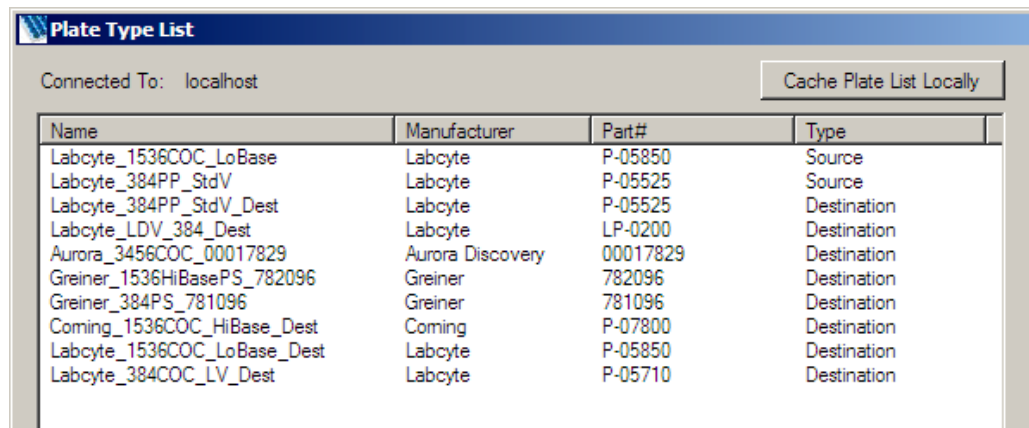
Source plate definitions: Source plates require very exacting specifications and calibration to accurately transfer nanoliter volumes; therefore, they are defined specifically for the Echo liquid handlers and tested at Labcyte (Echo-qualified). For this reason, source plates cannot be defined by the user. For existing source plates, only the barcode location can be edited. Contact Labcyte to add more source plates.

Destination plate definitions: The Echo liquid handler is programmed with several compatible destination plates; however, you can add destination plates through the Echo Cherry Pick software or the Echo liquid handler software.

See online Help for procedures on adding, editing, or deleting labware.

Fields:

Name User-defined name to identify the plate. This name will be listed in the *Plate Type List* window



Name	Manufacturer	Part#	Type
Labcyte_1536COC_LoBase	Labcyte	P-05850	Source
Labcyte_384PP_StdV	Labcyte	P-05525	Source
Labcyte_384PP_StdV_Dest	Labcyte	P-05525	Destination
Labcyte_LDV_384_Dest	Labcyte	LP-0200	Destination
Aurora_3456COC_00017829	Aurora Discovery	00017829	Destination
Greiner_1536HiBasePS_782096	Greiner	782096	Destination
Greiner_384PS_781096	Greiner	781096	Destination
Coming_1536COC_HiBase_Dest	Coming	P-07800	Destination
Labcyte_1536COC_LoBase_Dest	Labcyte	P-05850	Destination
Labcyte_384COC_LV_Dest	Labcyte	P-05710	Destination

Barcode Location

Location of barcode label on the destination plate:

None
Left
Right
Long

Manufacturer

Name of the plate manufacturer

Lot Number

Lot number assigned by the plate manufacturer

Part Number

Part number assigned by the plate manufacturer

Rows

Number of rows in the microplate

Columns

Number of columns in the microplate

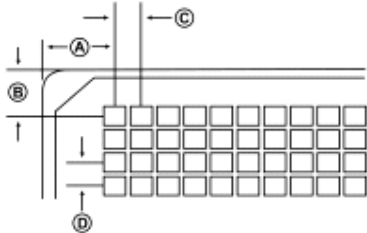
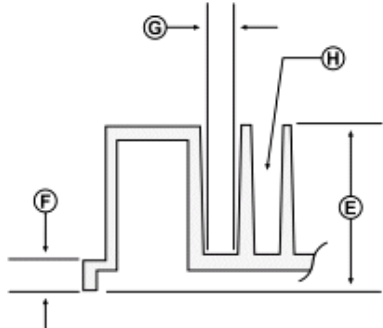
A1 X Offset (A)*

Distance from left outside edge to center of first column where The left edge of the part will be defined as the two 12.7 mm areas (as measured from the corners) as specified in ANSI/SBS 1-2004 (internet link). Valid range: 0.0 to 128.0 mm.

A1 Y Offset (B)

Distance from top outside edge to center of first row where The top edge of the part will be defined as the two 12.7 mm areas (as measured from the corners) as specified in ANSI/SBS 1-2004 (internet link). Valid range: 0.0 to 86.0 mm.

* The items marked A-G are measurements that need to be taken by hand or filled in from the manufacturer's specifications. These dimensions and further details on their definitions can be found at <http://www.sbsonline.com/msdc/approved.php>.

X Center Spacing (C)	Column spacing: Each following row/column shall be an additional X.Y mm in distance from the top/left outside edge of the plate as specified in ANSI/SBS 4-2004 (internet link). Valid range: 0.05 to 9.0 mm.
Y Center Spacing (D)	Row spacing: Each following row/column shall be an additional X.Y mm in distance from the top/left outside edge of the plate as specified in ANSI/SBS 4-2004 (internet link). Valid range: 0.05 to 9.0 mm. 
Plate Height (E)	The overall height of the plate as specified in ANSI/SBS 2-2004 (internet link). Valid range: 6.5 to 14.5 mm.
Flange Height (F)**	The height of the flange (skirt) as specified in ANSI/SBS 3-2004 (internet link). Valid choices: 2.41 mm, 6.10 mm, and 7.62 mm. See Note 2 below.
Well Width (G)	The width of the well opening at the bottom (not an SBS specified dimension). Valid range: 0.0 to 86.0 mm.
Well Capacity (H)	The overall capacity of the well in microliters. Valid range: greater than 0.0 uL. 

** Currently, the Echo liquid handler does not use dimensions F (flange height) and H (well capacity). Any value entered for flange height or well capacity is ignored.

4.3.3 Plate Export

The *Export Plates* window displays the plates currently available in the Echo Cherry Pick software. You can select and export one or more plates to a file (.elw file extension) for use in another application.

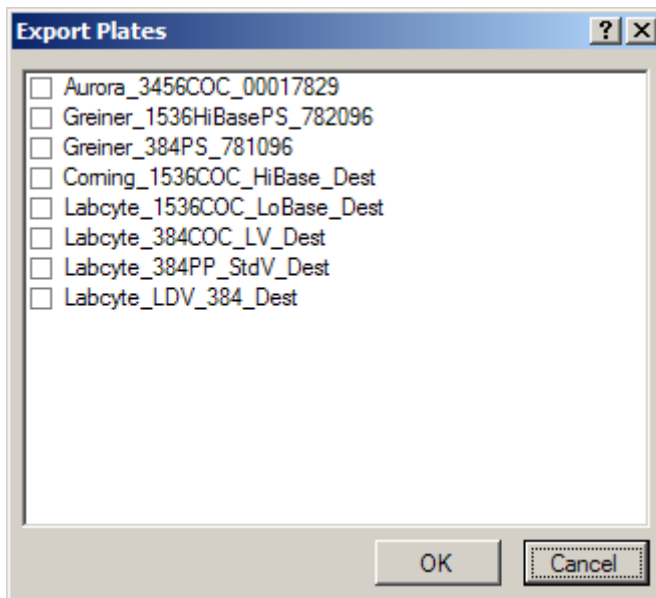


Figure 4-5: Export Plates Window

See online Help for procedure on exporting labware.

4.4 Pick List

The Pick List window enables you to import and edit the compound and control pick lists, and preview the destination plate layout. This window contains the following windows:

- **Compounds:** to import and edit a compound pick list.
- **Controls:** to import and edit a control pick list.
- **Plate Preview:** to view the compounds and controls as they appear on the source plates, and to view the compounds and controls as they will appear on the destination plate, based on the pick list and the plate design in the protocol.

4.4.1 Compounds and controls window

The *Compounds* and *Controls* windows contain command buttons to import and manage compound and control pick lists. The window displays the pick list data in a table containing text fields that can be edited.

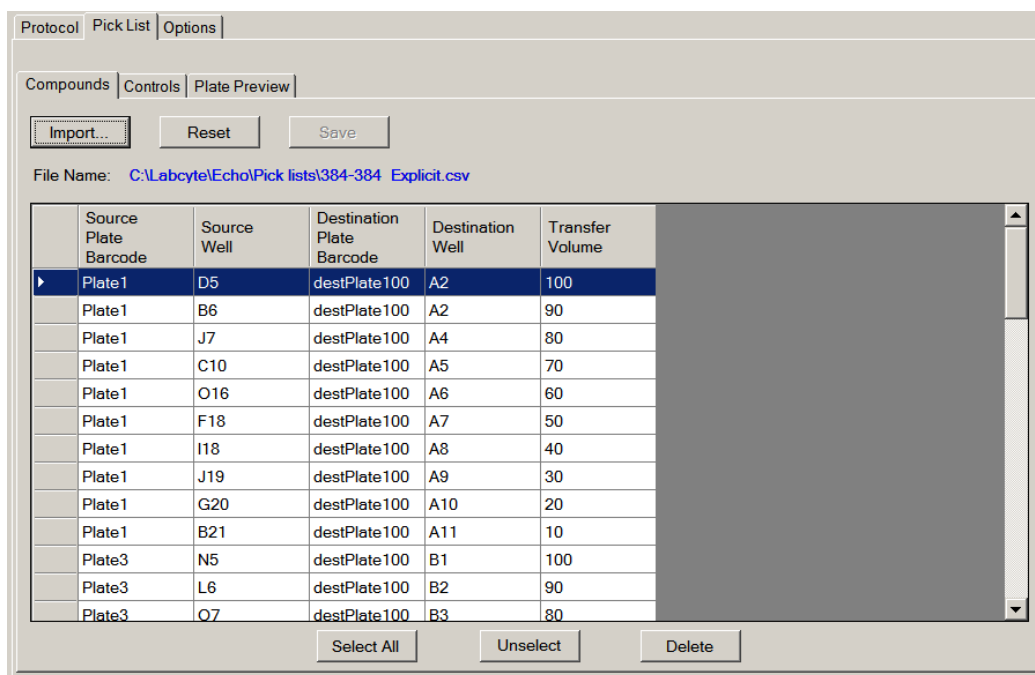


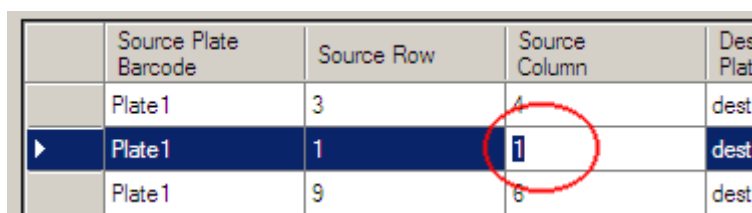
Figure 4-6: Compound pick list window

Command buttons in Compound and Control windows:

- **Import:** Opens a dialog box to find and select a pick list in .csv or .txt file format. Opens the *Import Compound* or *Import Controls* dialog box. See “*Color Legend*” on page 54 for more information.
- **Reset:** Removes the pick list from the protocol.
- **Save:** Updates the original pick list with any changes you have made to the imported pick list.

Note: If you **DO NOT** want to change the original pick list, import a copy of the pick list. You will be prompted to save the edited pick list when you run the protocol. Although you do have the option to click **No** in the *Save* prompt box before the protocol run, it is safer to use a copy of the pick list.

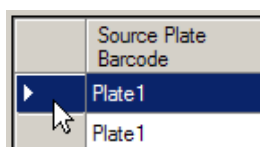
- **File Name:** Displays the directory location and file name of the imported pick list.
- **Edit window:** Displays the pick list data. You can edit the pick list as follows:
 - ◆ **Sort by heading.** Click a column heading to sort by this heading. An arrow will appear to indicate the direction of the sort (▲ ascending; ▼ descending)
 - ◆ **Edit a single value.** Click or double-click the value and enter the new value. Use the scroll bars to view all columns and rows. Use the **Tab** key or arrow keys to move to the next field.



	Source Plate Barcode	Source Row	Source Column	Des
	Plate 1	3	4	dest
▶	Plate 1	1	1	dest
	Plate 1	9	6	dest

Figure 4-7: Edit pick list value

- ◆ **Select rows.** Click any field in the table or click the cell to the left of the first data column to select a single row; click and drag the mouse pointer up or down to select consecutive rows; press the **Control** key and click any field in the desired rows to select non-consecutive rows.
- ◆ **Select All.** Click the **Select All** button at the bottom of the *Edit* window.
- ◆ **Unselect.** Click the Unselect button at the bottom of the *Edit* window to unselect any previously selected rows.
- ◆ **Delete rows.** Select the table rows to be deleted and click the **Delete** button at the bottom of the window.



	Source Plate Barcode	Des
▶	Plate 1	
	Plate 1	

Figure 4-8: Delete pick list row

4.4.2 Plate Preview window

The *Plate Preview* window displays the plate layout of the source and destination plates.

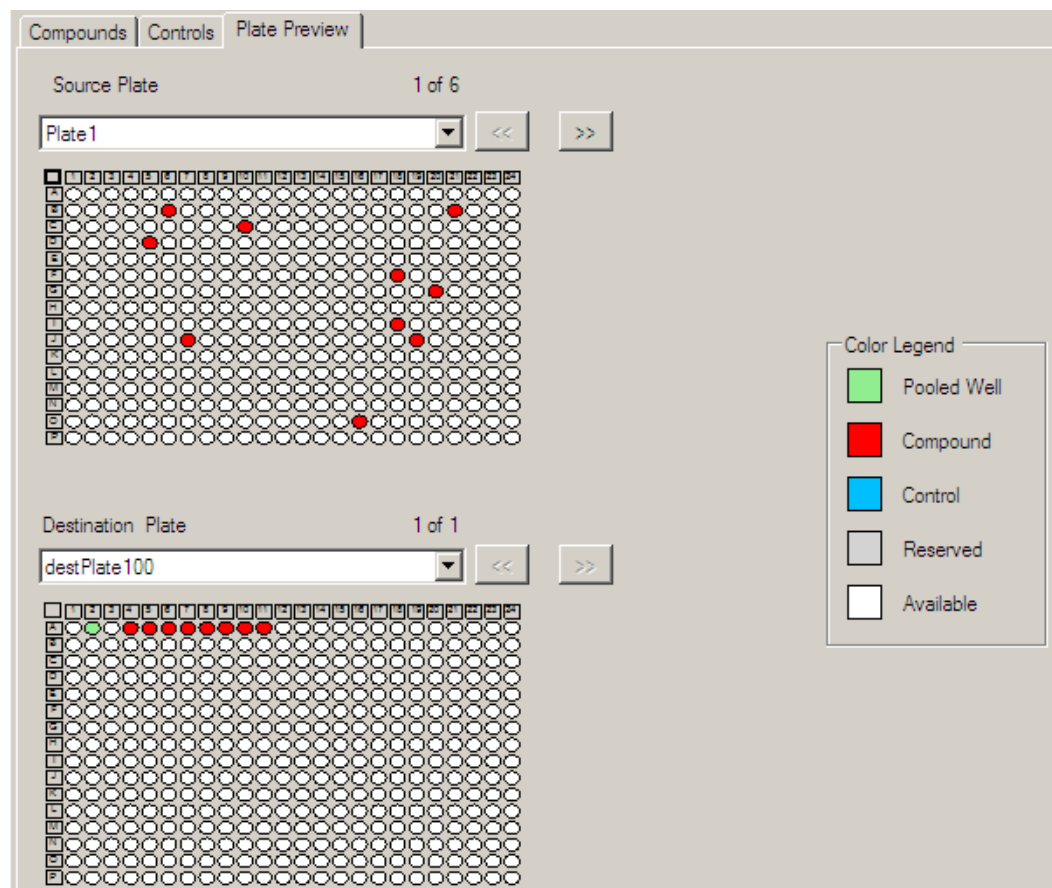






Figure 4-9: Plate Preview window

Command buttons and Color Legend in Plate Preview:

- **Source Plate:** Displays the plate layout for each source plate in the pick list. You can view different plates by selecting them from the *Source Plate* menu or clicking the left or right arrow   keys.
- **Destination Plate:** Displays the destination plate layout that is specified either in the *Protocol* window or in the pick list. You can view different plates by selecting them from the *Destination Plate* menu or clicking the left or right arrow   keys.
- **Color Legend:** Defines the colored wells that are used in the plate layouts.
 - ♦ **Pooled Well (green):** More than one compound in the same well.
 - ♦ **Compound (red):** Single compound in the well.
 - ♦ **Control (blue):** Single control in the well.
 - ♦ **Reserved:** Well blocked from compound transfer. This setting is ignored when the destination wells are explicitly called out.
 - ♦ **Available:** Empty well.

4.4.3 Import Compound and Control List windows

The *Import Compound (Control) List* window contains all of the pick list formats that the Echo Cherry Pick software supports.

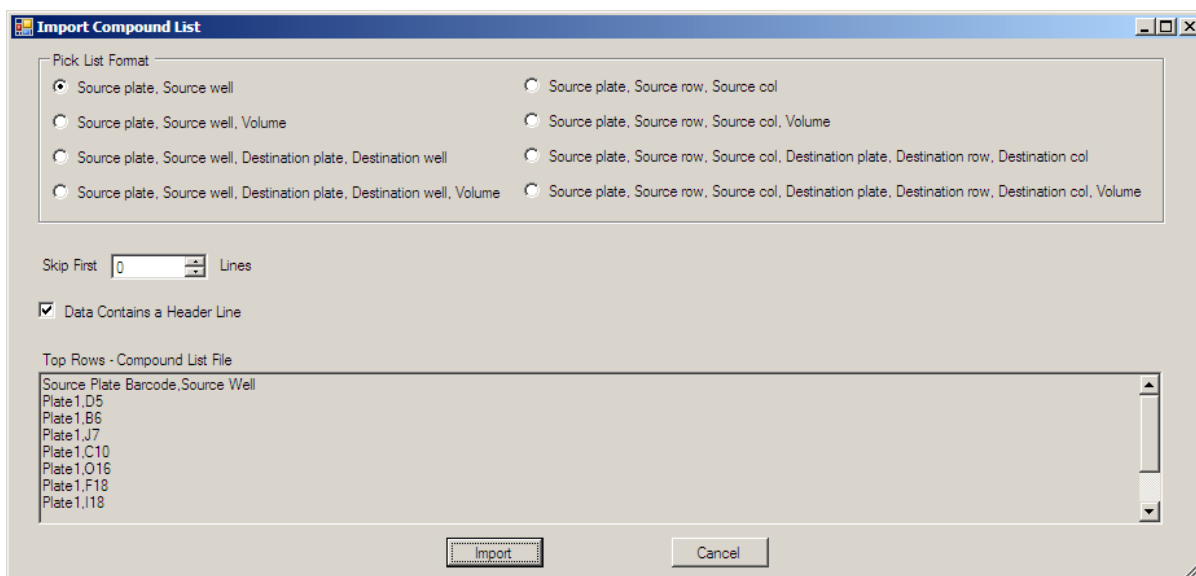


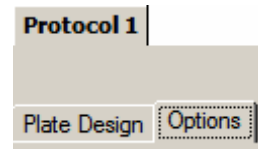
Figure 4-10: Import Compound list window

For a discussion on pick lists, see *"What is a Pick List?"* on page 4 and *"Create Pick Lists"* on page 18.

- **Skip First Lines:** Option to remove the header line and additional consecutive rows.
- **Data Contains a Header Line:** Setting to indicate that the pick list begins with column headings.
- **Top Rows – Compounds List File:** Dynamic preview of top rows in the pick list. Removes the top row from the preview each time a line is skipped in the **Skip First Lines** field.

4.5 Protocol Options

The *Protocol/Options* window is accessible by clicking the *Options* tab behind the Plate Design tab. This window enables you to customize the survey, output, and reporting options for the Echo Cherry Pick software. These settings are automatically used for any protocol you create.



The *Protocol/Options* window displays the following protocol and output options.

A screenshot of the 'Protocol Options' window. The window has two tabs: 'Plate Design' and 'Options'. The 'Options' tab is selected. The window is divided into four main sections: 'Protocol Options', 'Output Options', 'Transfer Reports', and 'Survey Reports'.
1. 'Protocol Options' section: Contains a 'Surveys' group box with two radio buttons: 'Re-Survey every source plate' (selected) and 'Maintain survey history'.
2. 'Output Options' section: Contains an 'Output Files' group box with two radio buttons: 'Run-specific' (selected) and 'Source Plate-specific (affected by processing order)'.
3. 'Transfer Reports' section: Contains a 'Save transfer reports as file type:' label with three checkboxes: 'XML' (checked), 'CSV' (checked), and 'TXT' (unchecked). Below this are three buttons: 'Format...', 'Directory...', and 'Filename...', each followed by a blue '<DEFAULT>' link.
4. 'Survey Reports' section: Contains a 'Save survey reports as file type:' label with three checkboxes: 'XML' (checked), 'CSV' (checked), and 'TXT' (unchecked). Below this are three buttons: 'Format...', 'Directory...', and 'Filename...', each followed by a blue '<DEFAULT>' link. The 'Format...' button in this section is highlighted with a dashed border.

Figure 4-11: Options Window

Note: The options settings are similar to the *Preferences/Options* window, but apply only to the displayed protocol.

4.5.1 Survey History

The *Survey History* function stores survey data for source plates. When the source plate is returned to the Echo liquid handler, the Echo Cherry Pick software recalls and uses the stored survey data instead of resurveying the plate.

This feature can reduce processing time during a protocol run—particularly if the source plate is swapped several times during a protocol run. You can specify the length of time that the survey data is retained, from a few minutes to never resurvey.

The software stores the survey data by plate barcode; therefore, the data is independent of the protocol and can be used repeatedly in different protocols until the expiration time.

Note: Various factors can affect the content of the source wells, such as DMSO concentration, humidity, and exposure time during the transfer run; therefore, consider these factors when you select an expiration time.

For additional information, read the user note *“How Long Will A Survey Last When Performing Acoustic Droplet Ejections?”* on www.labcyte.com (Library>Resources>Notes) or use the link <http://www.labcyte.com/Index.aspx?pageid=1000339>.

The *Survey History* function is located in the *Options* window:

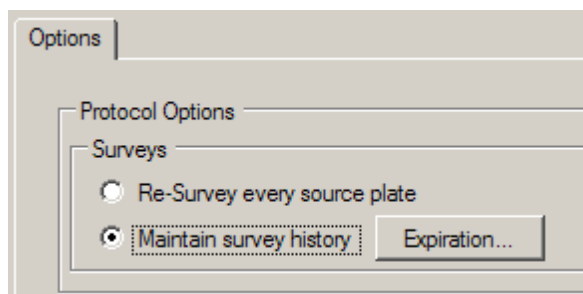


Figure 4-12: Survey option

Control Buttons:

- **Re-survey every source plate:** Default setting that automatically surveys the source plate every time the protocol is run.
- **Maintain Survey History:** Expiration button opens the *Survey Data Expiration* dialog box.

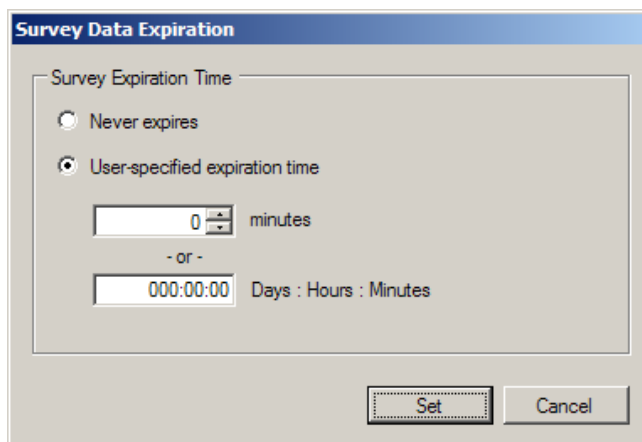


Figure 4-13: Survey Data Expiration

Control Buttons:

- **Never expires:** Existing survey data is always re-used.
- **User-specified expiration time:** Existing survey data is re-used for the time that is specified in *minutes* or *days:hours:minutes*.

Notes:

- If a stored survey does not cover the plate area that is required by the protocol (for example, some of the wells were empty when the plate was originally surveyed, but then filled later on), the software will survey the missing wells and add this data to the stored survey data.
 - The stored survey data is instrument-specific. For example, if a source plate is surveyed in instrument A, the stored survey data cannot be used in instrument B.
 - Although survey history can be used indefinitely, it is not recommended.
-

4.5.2 Output Files

The *Output Files* box in the *Options* window organizes the survey and transfer results according to the following criteria:

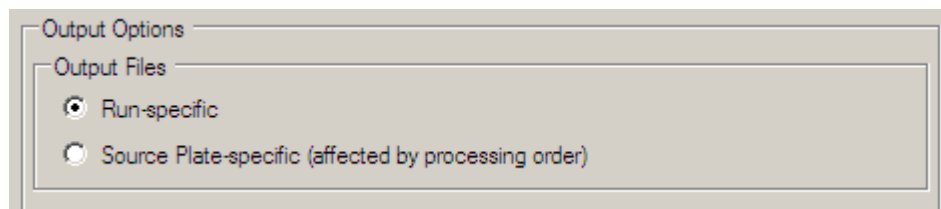
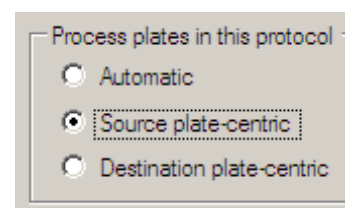


Figure 4-14: Output Files options

Run-specific: All protocol data is stored in one file, in the order that the results are generated.

Plate-specific: Protocol data is stored in separate files, based on source or destination plates (depending on which process order you specified in the *Plate Design* window).



4.5.3 File Type

Survey and transfer results can be saved to the following file formats that are compatible with most laboratory information systems:

- ♦ **XML** (extensible markup language)
- ♦ **CSV** (comma separated values)
- ♦ **TXT** (text file)

The results will be saved in the formats you have checked, and stored in the directory you specify in the *Directory* option.

Report Format

The survey and transfer reports can be customized by clicking the **Format** button in the *Protocol Options* window.

Note: The *DEFAULT* settings in the Transfer and Survey Reports are from the Preferences/Options window.

The screenshot shows the 'Protocol Options' window with the 'Options' tab selected. The window is divided into four main sections: 'Protocol Options', 'Output Options', 'Transfer Reports', and 'Survey Reports'.
1. **Protocol Options**: Contains a 'Surveys' section with two radio buttons: 'Re-Survey every source plate' (selected) and 'Maintain survey history'.
2. **Output Options**: Contains an 'Output Files' section with two radio buttons: 'Run-specific' (selected) and 'Source Plate-specific (affected by processing order)'.
3. **Transfer Reports**: Contains a 'Save transfer reports as file type:' section with three checkboxes: 'XML' (checked), 'CSV' (checked), and 'TXT' (unchecked). Below this are three buttons: 'Format...' (highlighted with a dashed border), 'Directory...', and 'Filename...'. Each button has a corresponding '<DEFAULT>' link to its right.
4. **Survey Reports**: Contains a 'Save survey reports as file type:' section with three checkboxes: 'XML' (checked), 'CSV' (checked), and 'TXT' (unchecked). Below this are three buttons: 'Format...' (highlighted with a dashed border), 'Directory...', and 'Filename...'. Each button has a corresponding '<DEFAULT>' link to its right.

Figure 4-15: Report Format Options

The *Output Format Builder* window shows all the report variables (left selection box) that can be added to the report format (right selection boxes). The list of variables changes with the report area that you select.

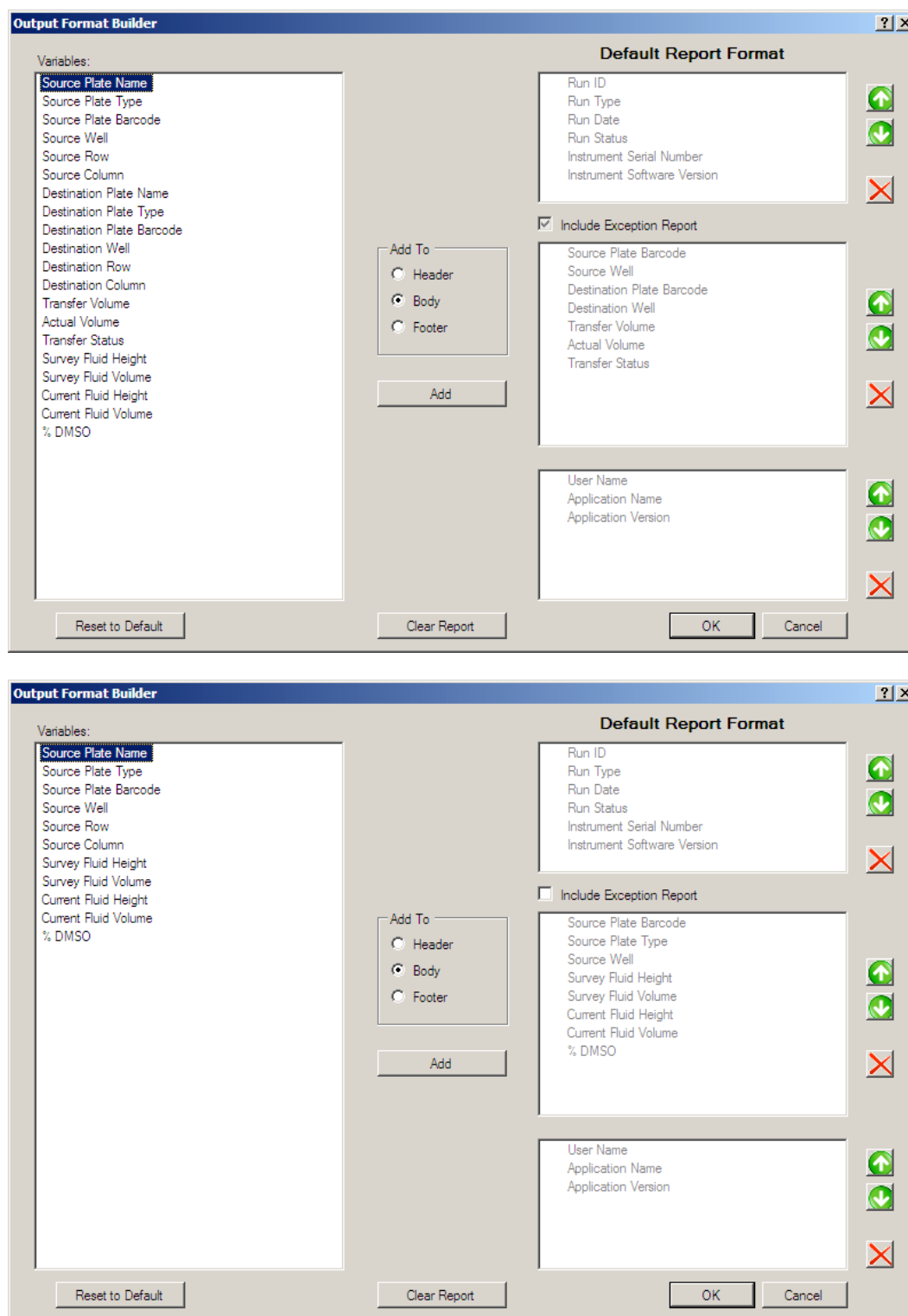


Figure 4-16: Survey and Transfer Output Format Builder

Report Directory

The default *report directory* for both surveys and transfers is **C:\Labcyte\Echo\Reports**. You can specify a different directory by clicking the **Directory** button and entering a new location. Use the **Select Folder** button to browse to a different directory.

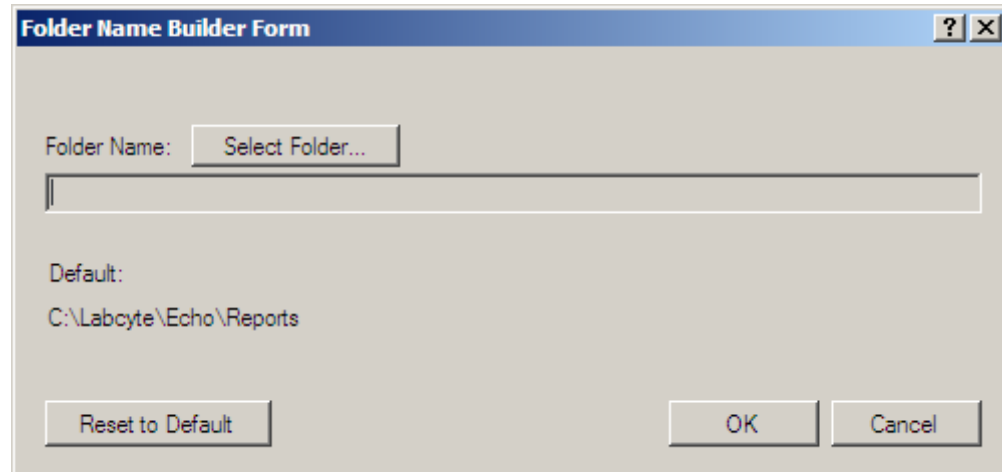


Figure 4-17: Folder Name Window

Report Filename

The Echo Cherry Pick software uses the following default formats to report the survey and transfer results:

Survey results file name:

\$AppName\$\RunDate\$\InstrSN\$_RunType\$_SrcPlateName\$(\$SrcPlateBarcode\$)

For example: Labcyte Echo Software\2007-Jan-09\E5XX-0690_Print_Plate1(1-989992-0)

Transfer results file name:

\$AppName\$\RunDate\$\InstrSN\$_RunType\$_SessionID\$

For example: Labcyte Echo Software\2007-Jan-09\E5XX-0690_Print_123

The survey and transfer formats can be changed by clicking the **Format** button in the *Protocol Options* window.

The image displays two screenshots of the 'Filename Builder Form' window, which is used to create file names based on various system variables. Both screenshots show a list of variables on the left and a template field on the right.

Top Screenshot:

- Variables:** A list of variables including User Name, Application Name, Application Version, Protocol Name, Session ID, Run ID, Run Date, Run Type, Run Status, Instrument Name, Instrument Model, Instrument Serial Number, Instrument IP Address, Source Plate Name, Source Plate Type, Source Plate Barcode, Destination Plate Name, Destination Plate Type, and Destination Plate Barcode. 'User Name' is selected.
- Filename Template:** An empty text field.
- Example:** Labcyte Echo Software\17-Oct-2006 12:26:54PM\E55X-0001_Print_123
- Default:** \$AppName\$\RunDate\$\InstrSNS_\$RunType\$_\$SessionID\$
- Buttons:** >>>, Clear, Check Filename, Reset to Default, OK, Cancel.

Bottom Screenshot:

- Variables:** The same list of variables as the top screenshot. 'User Name' is selected.
- Filename Template:** An empty text field.
- Example:** Labcyte Echo Software\17-Oct-2006 12:26:54PM\E55X-0001_Print_Plate 1(1-989992-0)
- Default:** \$AppName\$\RunDate\$\InstrSNS_\$RunType\$_\$SrcPlateName\$(\$SrcPlateBarcode\$)
- Buttons:** >>>, Clear, Check Filename, Reset to Default, OK, Cancel.

Figure 4-18: Survey and Transfer Filename Builder

4.6 Preferences

The *Preferences/Options* window is accessible from the *Tools* menu. This window is very similar to the **Protocol Options** window, but with the following differences:

- Settings are automatically applied to all procedures unless you make changes in the *Protocol Options* window (report formats shown as "default").
- Accessible from the Toolbar.

When you click **Preferences**, the *Options* window* opens to display the following protocol and output options:

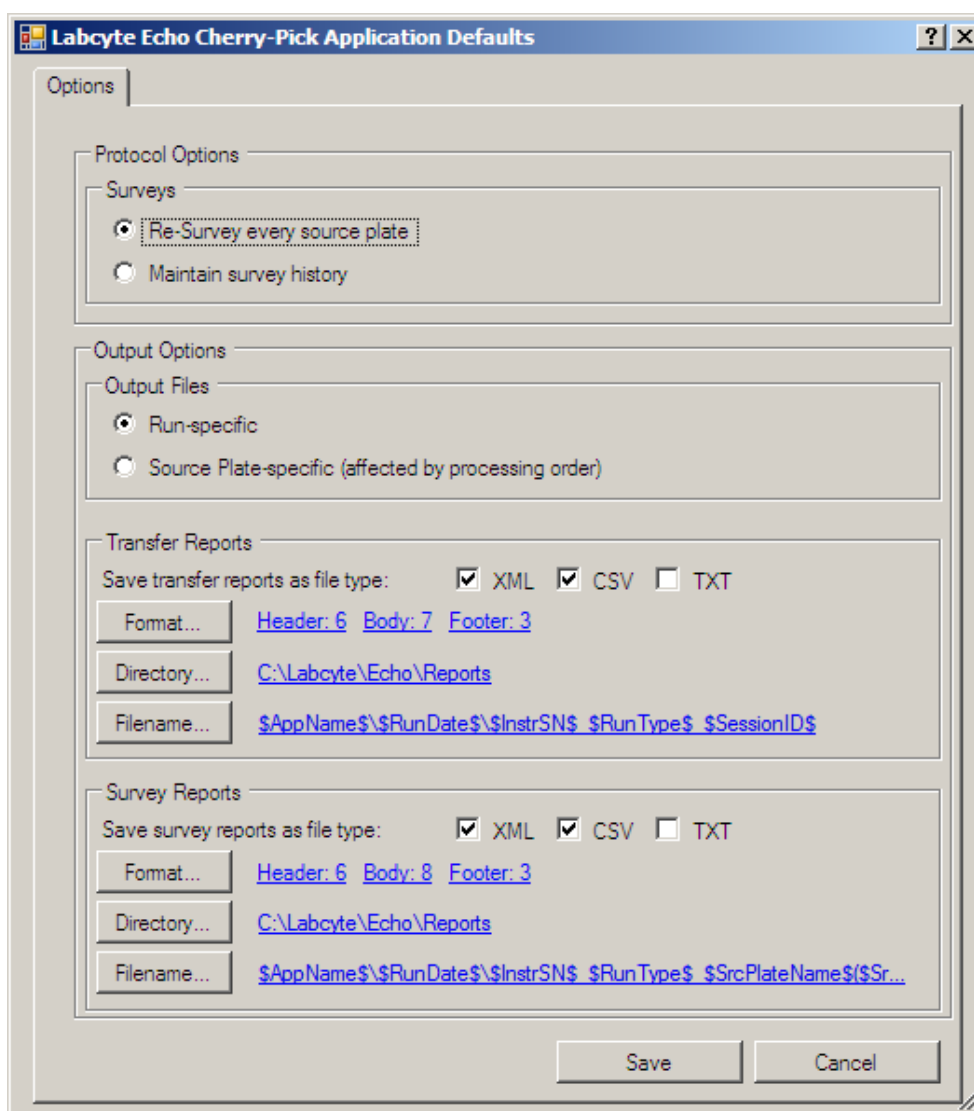
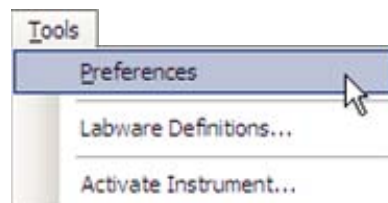


Figure 4-19: Preferences/Options Window

4.7 Run Protocol

The Run Options window enables you to run a simulation of the transfer protocol or run the transfer protocol on the Echo instrument. If you are not connected to an Echo instrument, this window also provides a connection dialog box.

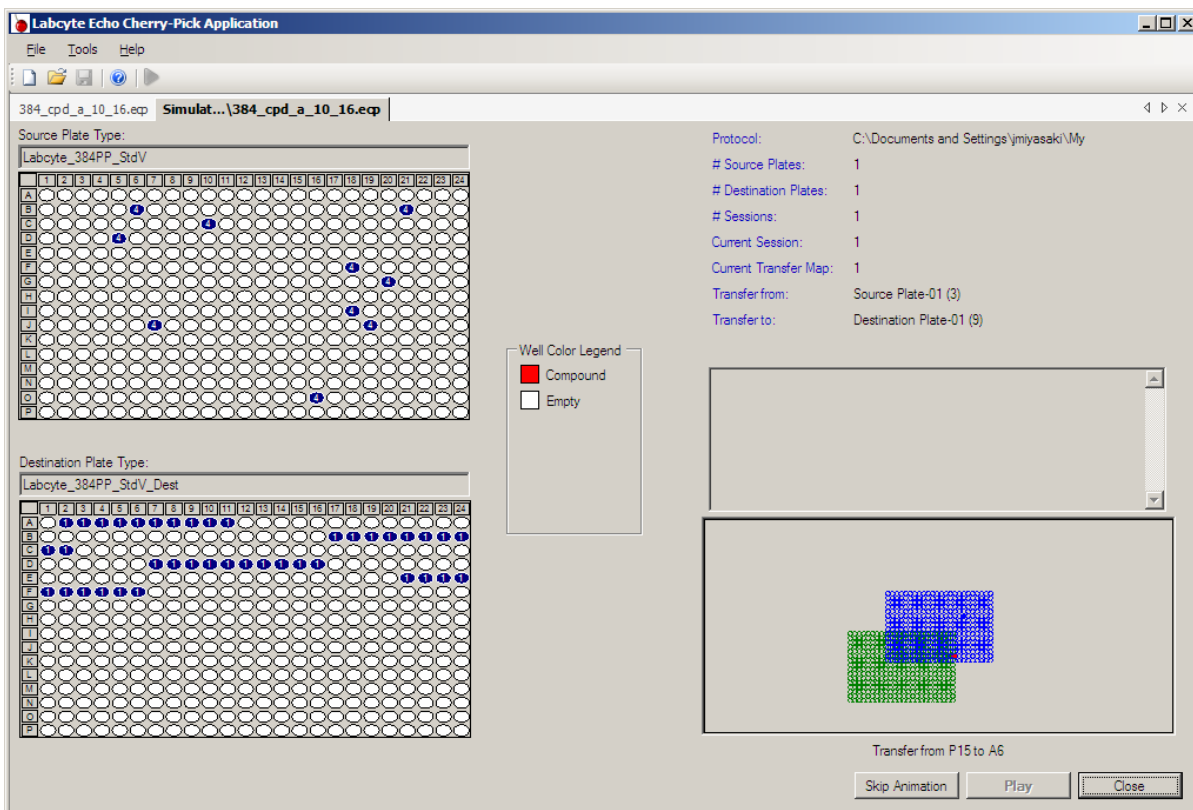
In the Run Options window, you have the following options:

- **Connect to**—or disconnect from—an Echo instrument
- **Import** compound and control pick lists, if you did not import them earlier. (The **Reset** button removes the pick list from the protocol).
- **Pre-process pick lists in the order specified.** Direct the software to use the pick list to determine the source plate order.
- **Simulate** a transfer protocol.
- **Run** a transfer protocol on the Echo instrument.

4.8 Simulator window

The simulator is an animation of fluid transfer for the selected protocol. The simulation is interactive and allows you to respond to a prompt box to insert and remove plates. Since this is a simulation, the prompt box appears for only 5 seconds, then the software automatically responds to the prompt and continues to the next step.

The protocol example that is described in this help page uses a pick list of compounds in five source plates and a control plate transferring to a single destination plate. The components of the simulator window are described below.



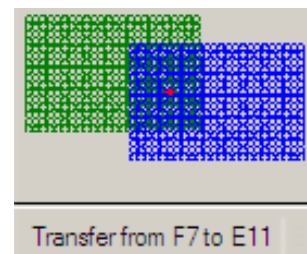
The **transfer animation** (lower right corner of the window) simulates the movement of the destination plate (green) as it receives liquid from the source plate. Each source-to-destination well transfer is documented below the plates.

The following command buttons are available:

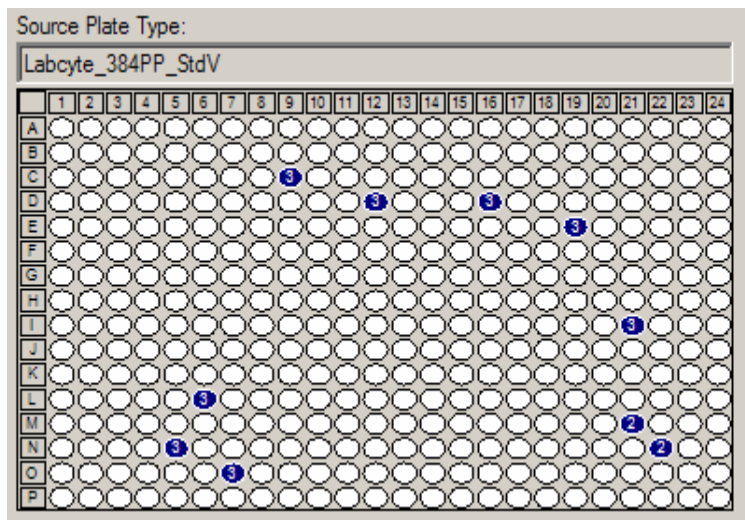
Skip Animation: stops a simulation in progress and shows the final view of the source and destination plates.

Play: begins the simulated compound transfer.

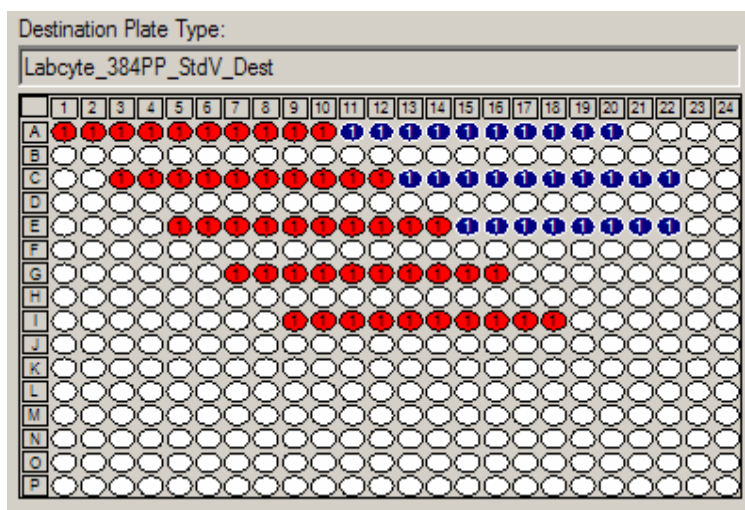
Close: closes the simulation window. If a simulation is in progress, you will need to cancel it before you can close the window.



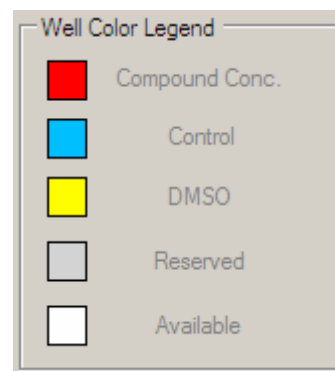
The **Source Plate Type** map (upper left) shows the source plate that is selected for transfer. As the simulation runs, each source well shows the number of times the compound is aspirated. In this sample graphic the second source plate is in the process of being aspirated 5 times. The destination wells in red were transferred from the first source plate.



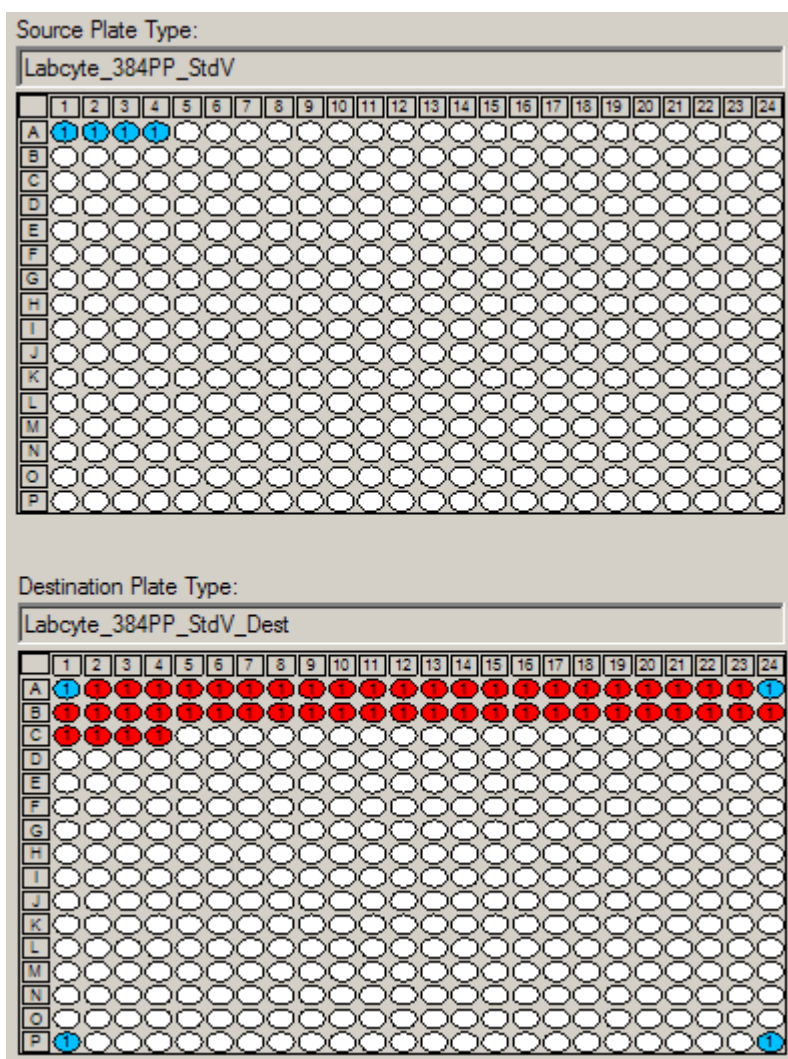
The **Destination Plate Type** map (lower left) shows each well that receives a dispense and the number of dispenses that are received. In this sample graphic each compound is transferred to a destination well across a row. Since the protocol specified 5 replicates, the row is repeated 5 times. The red wells signify the compound transferred from the first source plate; the blue wells signify the compound being transferred from the second source plate.



The **Well Color Legend** (middle) shows the colors that correspond to the compound being transferred (red), controls (cyan), DMSO (yellow), reserved, or blocked from transfer (gray), and available (wells that have not been aspirated or dispensed). Dark blue wells represent wells that are in the middle of the transfer process. When the transfer is complete, the well changes to the color that matches the Well Color Legend.



The sample graphic of a completed run shows the 6th source plate with controls and destination plate with compound and control.

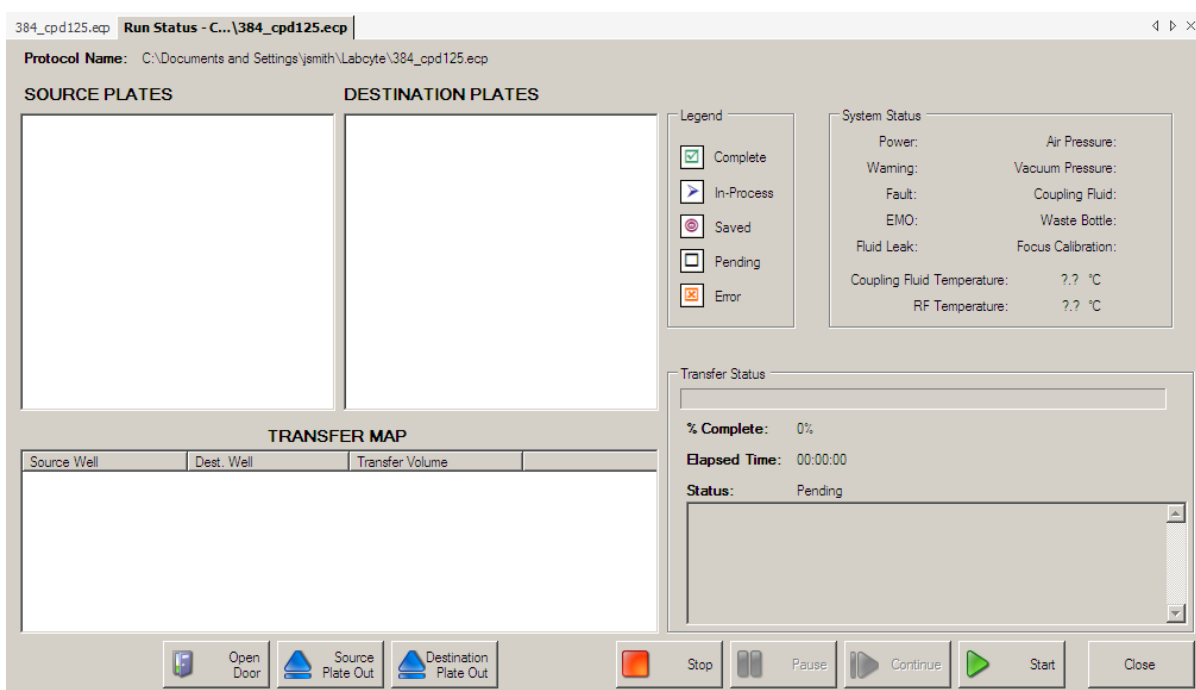


The Protocol information box (upper right) provides details about the transfer protocol, such as the number of plates that will be needed. As the simulation proceeds, this box is updated to show which plates are currently in use.

Protocol:	C:\Documents and Settings\Labocyte\ECP pick
# Source Plates:	6
# Destination Plates:	1
# Sessions:	6
Current Session:	0
Current Transfer Map:	0
Transfer from:	Control Plate-01 (8)
Transfer to:	Destination Plate-01 (9)

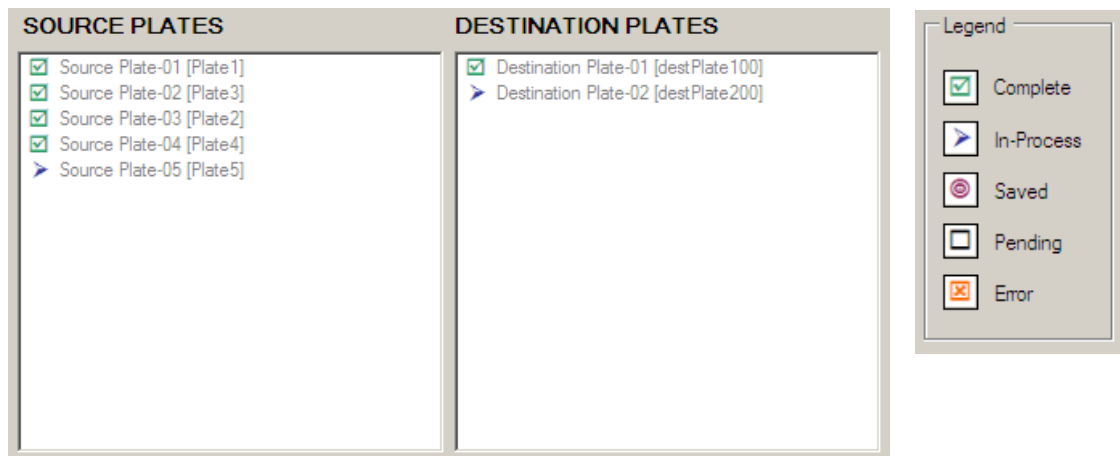
4.9 *Run Status window*

The Run Status window is a dynamic window that provides control buttons to run the protocol, and various status windows to show the progress of the compound transfer, the state of the Echo instrument, and the final well positions and volume of the transferred fluid.



Control buttons: Provides manual controls of the Echo instrument from the Echo Cherry Pick software.

Source and Destination Plate windows: Shows the status of each plate as it progresses through the transfer protocol. The **Legend** interprets the symbols used in the status windows.



Transfer Map window: Shows the details of each well-to-well transfer.

TRANSFER MAP			
Source Well	Dest. Well	Transfer Volume	
I22	A6	2.5	
E9	A7	2.5	
H11	A8	2.5	
L12	A9	2.5	
G15	A10	2.5	
O15	A10	2.5	
G16	B1	2.5	
F18	B2	2.5	
C20	B3	2.5	
E22	B4	2.5	

System Status window: Shows the status of the Echo instrument during the transfer run. If a problem occurs, the alert will appear on this screen.

System Status

Power:

Air Pressure:

Warning:

Vacuum Pressure:

Fault:

Coupling Fluid:

EMO:

Waste Bottle:

Fluid Leak:

Focus Calibration:

Coupling Fluid Temperature: 22 °C

RF Temperature: 43.5 °C

Transfer Status: Shows a progress bar of the transfer protocol, as well as percent completion and elapsed time. This section also provides a text window that displays all the actions that occur during the run.

Transfer Status

% Complete: 50%

Elapsed Time: 00:02:04

Status: Running

17-Oct-2006 01:59:08PM : Paused...
17-Oct-2006 01:59:09PM : Paused...
17-Oct-2006 01:59:14PM : Please remove Source Plate-01 [Plate1]
(Labcyte_384PP_StdV)
17-Oct-2006 01:59:35PM : Please insert: Source Plate-02 (Labcyte_384PP_StdV)
17-Oct-2006 01:59:46PM : Surveying plate...

Control Status buttons

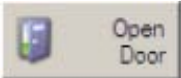

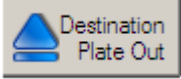
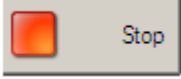


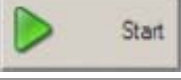
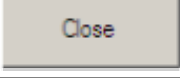
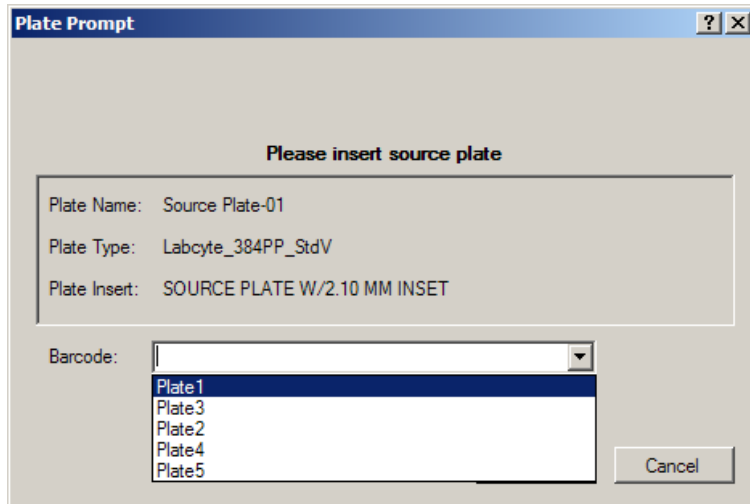
Control Buttons	Action
 The button features a small icon of a door with a handle and the text "Open Door" to its right.	Opens the process door of the connected Echo liquid handler.
 The button features a blue icon of a gripper holding a plate and the text "Source Plate Out" to its right.	Extends the source plate gripper.
 The button features a blue icon of a gripper holding a plate and the text "Destination Plate Out" to its right.	Extend the destination plate gripper.
 The button features a red square icon and the text "Stop" to its right.	Stops the transfer protocol that is in progress.
 The button features a blue icon of two vertical bars and the text "Pause" to its right.	Pauses the transfer protocol that is in progress.
 The button features a blue icon of a right-pointing triangle and the text "Continue" to its right.	Continues the transfer protocol that is in progress.
 The button features a green icon of a right-pointing triangle and the text "Start" to its right.	Begins the transfer protocol.
 The button features the text "Close" in the center.	Closes the Run Status window.

Plate Prompt

The *Plate Prompt* box instructs the user to insert or remove a plate. The plate prompt boxes are described below:

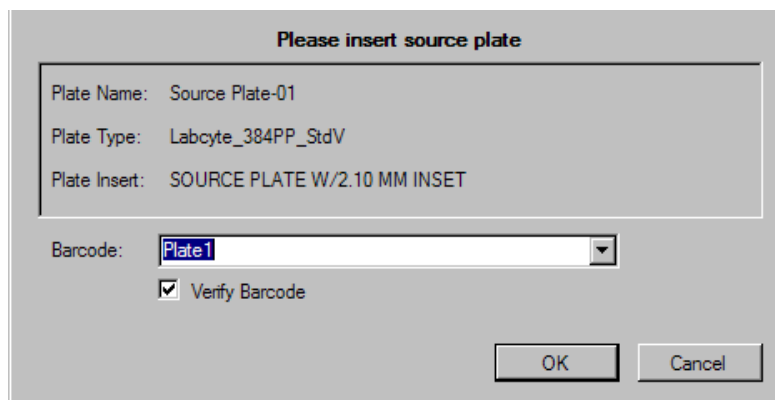
Please insert source plate:



1. Identify the source plate in one of the following ways:
 - ♦ **Plate ID:** Select the source plate ID from the drop-down menu.
 - ♦ **Barcode:** Skip the **Barcode** field and make sure the **Verify Barcode** option is selected. The Echo instrument will automatically scan the barcode label on the plate and insert it into the *Barcode* field.

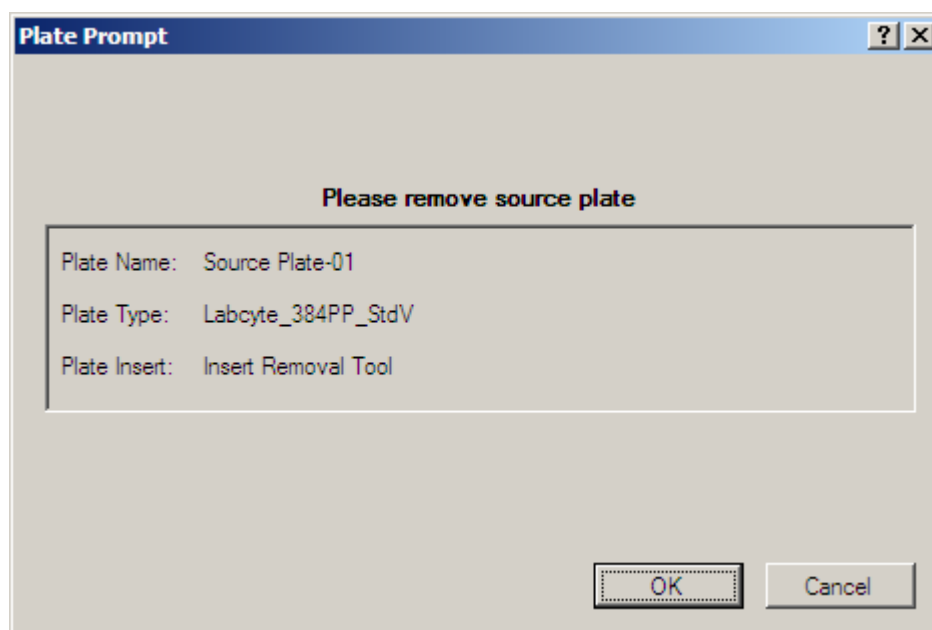
Note: If you skip the Barcode field and forget to select Verify Barcode, the software will display a plate read error.

- ♦ **Pre-processed pick lists:** Ensure that option in the *Run Option* window. If this option is selected, the *Barcode* field is initialized to display source plates listed in the pick list; therefore this field is not available for text changes (grayed out). However, you can disable the **Verify Barcode** option to bypass the barcode scan—particularly if you are using your own plate IDs instead of barcodes to identify the source plates.
2. Insert the source plate into the source plate gripper stage and click **OK** in the software screen.

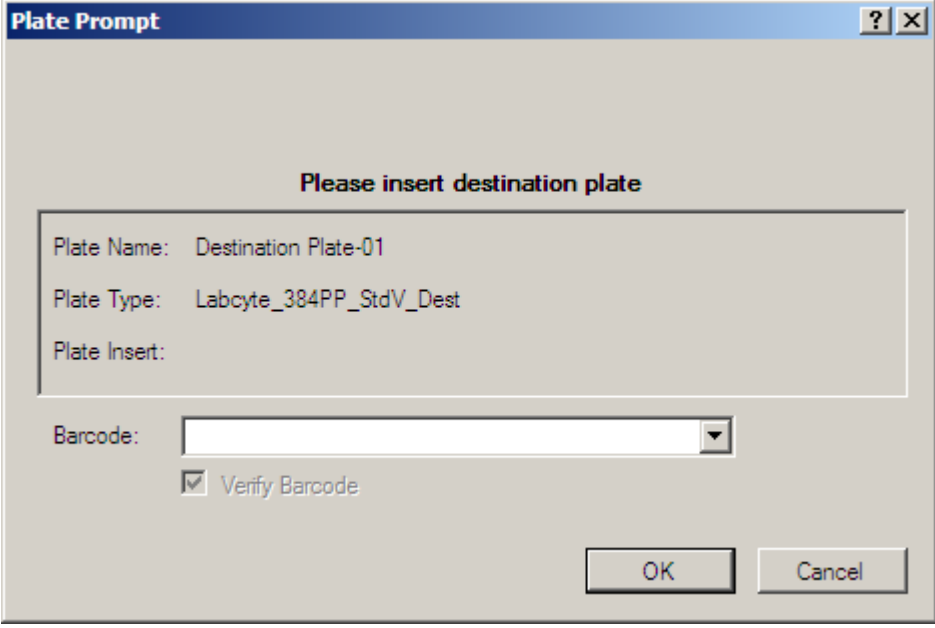


After the source plate is processed, the software removes it from the drop-down menu.

Please remove source plate: Remove the source plate and click **OK**.



Please insert destination plate:

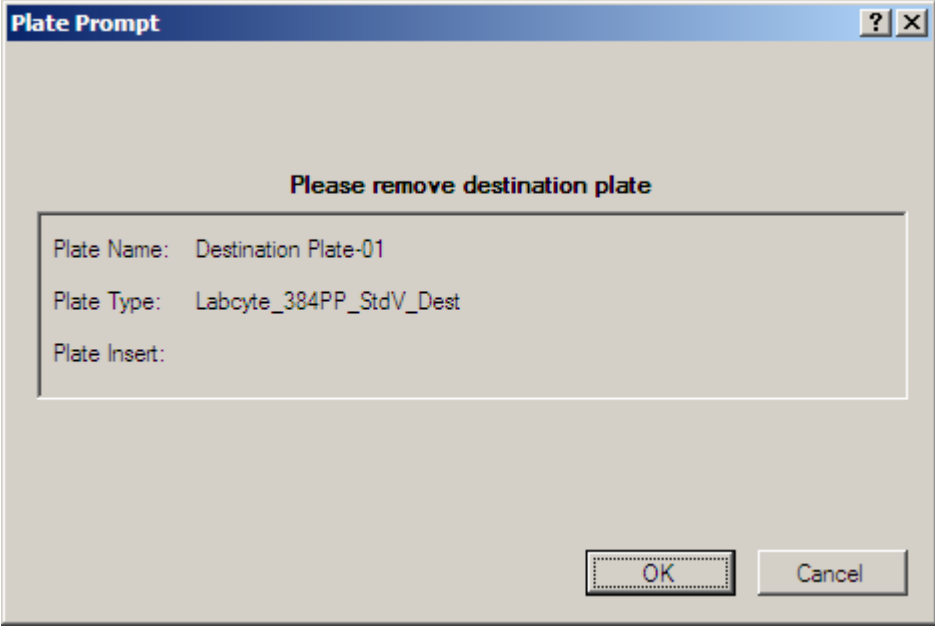


The 'Plate Prompt' dialog box has a title bar with a question mark and a close button. The main text reads 'Please insert destination plate'. Below this, there is a text box containing 'Plate Name: Destination Plate-01', 'Plate Type: Labcyte_384PP_StdV_Dest', and 'Plate Insert:'. Below the text box is a 'Barcode:' label followed by a drop-down menu. A checkbox labeled 'Verify Barcode' is checked. At the bottom right are 'OK' and 'Cancel' buttons.

- ◆ Select the source plate barcode (or plate ID) from the drop-down menu. If there is only one destination plate, the software will automatically select it and disable the verify barcode step.
- ◆ Select **Verify Barcode** (optional) and click **OK**.

After the destination plate is processed, the software removes it from the drop-down menu.

Please remove destination plate: Remove the destination plate and click **OK**.



The 'Plate Prompt' dialog box has a title bar with a question mark and a close button. The main text reads 'Please remove destination plate'. Below this, there is a text box containing 'Plate Name: Destination Plate-01', 'Plate Type: Labcyte_384PP_StdV_Dest', and 'Plate Insert:'. At the bottom right are 'OK' and 'Cancel' buttons. The 'OK' button is highlighted with a dashed border.

